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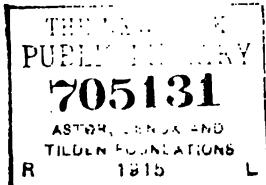
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## PREFACE

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The International Library of Technology is the outgrowth of a large and increasing demand that has arisen for the Reference Libraries of the International Correspondence Schools on the part of those who are not students of the Schools. As the volumes composing this Library are all printed from the same plates used in printing the Reference Libraries above mentioned, a few words are necessary regarding the scope and purpose of the instruction imparted to the students of—and the class of students taught by—these Schools, in order to afford a clear understanding of their salient and unique features.

The only requirement for admission to any of the courses offered by the International Correspondence Schools, is that the applicant shall be able to read the English language and to write it sufficiently well to make his written answers to the questions asked him intelligible. Each course is complete in itself, and no textbooks are required other than those prepared by the Schools for the particular course selected. The students themselves are from every class, trade, and profession and from every country; they are, almost without exception, busily engaged in some vocation, and can spare but little time for study, and that usually outside of their regular working hours. The information desired is such as can be immediately applied in practice, so that the student may be enabled to exchange his present vocation for a more congenial one, or to rise to a higher level in the one he now pursues. Furthermore, he wishes to obtain a good working knowledge of the subjects treated in the shortest time and in the most direct manner possible.

In meeting these requirements, we have produced a set of books that in many respects, and particularly in the general plan followed, are absolutely unique. In the majority of subjects treated the knowledge of mathematics required is limited to the simplest principles of arithmetic and mensuration, and in no case is any greater knowledge of mathematics needed than the simplest elementary principles of algebra, geometry, and trigonometry, with a thorough, practical acquaintance with the use of the logarithmic table. To effect this result, derivations of rules and formulas are omitted, but thorough and complete instructions are given regarding how, when, and under what circumstances any particular rule, formula, or process should be applied; and whenever possible one or more examples, such as would be likely to arise in actual practice—together with their solutions—are given to illustrate and explain its application.

In preparing these textbooks, it has been our constant endeavor to view the matter from the student's standpoint, and to try and anticipate everything that would cause him trouble. The utmost pains have been taken to avoid and correct any and all ambiguous expressions—both those due to faulty rhetoric and those due to insufficiency of statement or explanation. As the best way to make a statement, explanation, or description clear is to give a picture or a diagram in connection with it, illustrations have been used almost without limit. The illustrations have in all cases been adapted to the requirements of the text, and projections and sections or outline, partially shaded, or full-shaded perspectives have been used, according to which will best produce the desired results. Half-tones have been used rather sparingly, except in those cases where the general effect is desired rather than the actual details.

It is obvious that books prepared along the lines mentioned must not only be clear and concise beyond anything heretofore attempted, but they must also possess unequaled value for reference purposes. They not only give the maximum of information in a minimum space, but this information is so ingeniously arranged and correlated, and the

## PREFACE

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indexes are so full and complete, that it can at once be made available to the reader. The numerous examples and explanatory remarks, together with the absence of long demonstrations and abstruse mathematical calculations, are of great assistance in helping one to select the proper formula, method, or process and in teaching him how and when it should be used.

The subject of lettering and sign painting is treated in this volume in a manner consistent with modern practice. Not only are the various stages in the development of plain and ornamental signs considered in every detail, but examples of the best work done by leading craftsmen have been gathered, first, from excellent photographs of the best work extant, then reproduced in this volume by half-tone engravings, thus giving, throughout the text, the most graphic portrayal of the various characteristic embellishment and artistic treatment of each class of sign work and lettering under consideration. No alphabets are given except those most applicable to general practice and those most in demand and in use by the leading sign painters and letterers throughout the country. Nothing has been omitted that would thoroughly equip one who pursues this industry and give him a foundational, as well as an advanced, knowledge of every branch of this art. Sufficient colored examples are given to familiarize the craftsman with colors and their combinations and to illustrate the subject of shading and blending with colors.

The method of numbering the pages, cuts, articles, etc. is such that each subject or part, when the subject is divided into two or more parts, is complete in itself; hence, in order to make the index intelligible, it was necessary to give each subject or part a number. This number is placed at the top of each page, on the headline, opposite the page number; and to distinguish it from the page number it is preceded by the printer's section mark (§). Consequently, a reference such as § 16, page 26, will be readily found by looking along the inside edges of the headlines until § 16 is found, and then through § 16 until page 26 is found.

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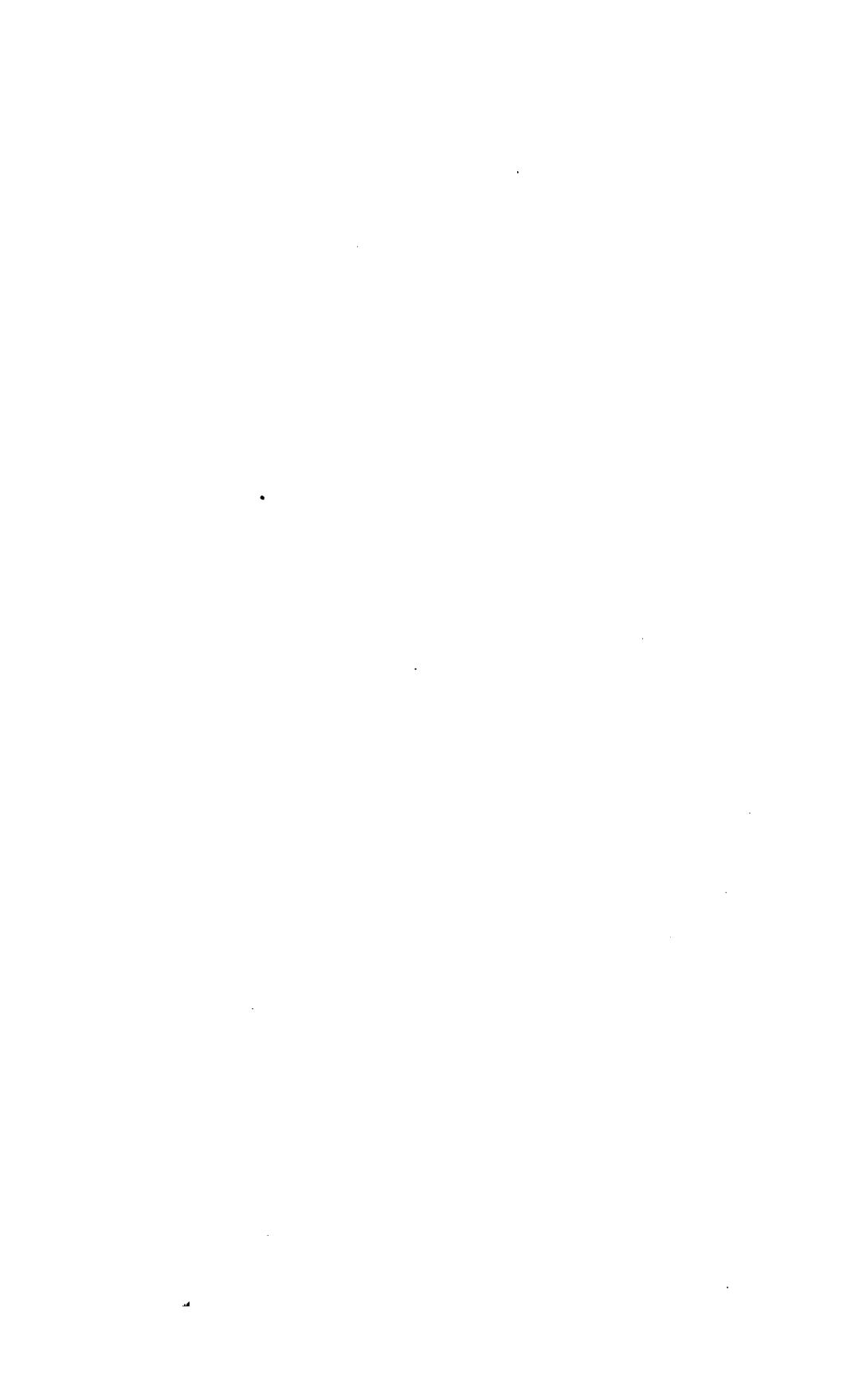
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# ELEMENTS OF LETTERING

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## INTRODUCTION

**1. Purpose of This Course.**—It is the purpose of this Course to combine the classical with the practical so as to meet the needs of all students desirous of studying the esthetic and antique, as well as the plain and simple, styles of lettering. The plates are therefore arranged and classified progressively, in order to lead the student gradually from the plain and simple into the most difficult styles, but omitting from the Course all such alphabets as are obsolete or not in common use.

Before requiring the student to apply himself to a study of the present forms and classifications of the letters of the alphabet, he should become familiar with their history and the primitive forms of writing. He should also note the important national changes that have caused a transition from one form to another, until our present advanced era has been reached with its great variety of styles, distinctively different in character one from another, and each arising from some important period in the world's history in which the fundamental or parent style was closely allied to a corresponding style of architecture predominating at that period.

In order that the student may derive the greatest benefit from this course in lettering, he should not rest content with merely reading this Section carefully once or twice, but should study its contents carefully throughout his entire Course. It is only after he has made some progress toward a knowledge of the styles and formation of letters that the real value and importance of much of the instruction given in this Section can be properly understood and its full meaning appreciated.

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**HISTORY OF THE ALPHABET**

**2. Classification.**—The wonderful achievements in printing, photoengraving, lithography, and other related arts have been the means of transforming the letters of the alphabet into a variety of forms or styles, which may be classified under three general heads: *plain*, *ornamental*, and *grotesque*. The history of the earliest methods of writing and of the origin and early forms of the alphabet characters known as *fundamental*, which have given rise to the modern alphabet and its various classical forms, will be found not only of interest, but also of great profit to one who is to devote himself to the art of lettering. The degree of perfection attained in the alphabet, not only in phonetic value, but also in simplicity and completeness, makes it a monument to the intellectual advancement of the present day—a condition to which the people of all ages have contributed, though the majority of those at present engaged in lettering have never considered its source nor the many changes necessary to its growth and perfection.

The twenty-six signs or letters that are called the **alphabet** are separated into two classes: those representing no syllabic sounds in themselves are called **consonants**, and those possessing two or more such sounds are called **vowels**. The latter, in some cases, are scarcely more than a breath sound, but each has a clear phonetic value, and fills an important place in our written language. By means of certain characters placed above the vowels, every word may be so written as to express its proper sounds. This generation, therefore, is enjoying the fruits of the achievements of the human intellect through forty centuries of development; for in tracing the origin of the alphabet and the signs that led to its construction it is necessary to travel back through a period of over 4,000 years—back to the dispersion of the human race—each epoch of which period is distinguished by interesting phases in the growth of letters. It will be impossible in this abbreviated history to fully consider this interesting development and growth or give more than a passing glance at the

world's primitive history; although in it is to be found the source of the forms whose transitions from one system of characters to another have resulted in the present alphabet. Nor can the relation these characters bear to one another be discussed. The degree of intelligence attained in each period of human history is marked by the progress made in the methods of writing, which enabled its people to record events, impart knowledge, and transmit messages to one another.

**3. Ideograms.**—Sacred history records that, when Babylon and Nineveh were built, all people were of one language, and the similarity of the Babylonian, Egyptian, and Assyrian sign languages gives evidence of this fact. The descendants of Noah are supposed to have occupied the following localities after the dispersion: Shem held Babylon and the countries to the east of it; Ham occupied northeastern Africa; and Japheth settled in western Assyria and Asia Minor.

Each system of writing began with rude pictures of objects, more or less conventional, which gradually became the representatives of words, afterwards becoming the symbols of letters, or elementary sounds. It is possible, therefore, to trace the transition from the **ideogram**, expressing thoughts by means of pictures, to the **phonogram**, expressing sounds by means of drawn or written symbols. Many ideograms are in common use at the present day, which proves that the Egyptian method was not without some merit. For instance, the sign \$ is derived from the monogram U. S. The barber's pole—the red stripe of which symbolizes a "blood-letter" (a custom of past ages)—the three balls used by the pawnbroker, the American flag, the sign of per cent. (%), the algebraic signs, and many others, all are ideograms.

**4. Cuneiform Writing.**—The letters of our alphabet are the outgrowth of the ancient Hebrew alphabet and Egyptian hieroglyphics (the earliest form of writing), as well as of the Assyrian cuneiform characters. In tracing to its origin the form of each letter, one is surprised at the marvelous transformations these characters have undergone

before reaching the simplicity that marks their present construction. While alphabetic systems have become simplified, the Chinese system, on the other hand, which is not alphabetic, has grown more and more complicated, and affords an example of a people, isolated for 4,000 years from the rest of the world, unable to advance beyond the ancient system of ideographic writing. The Chinese system is evidently the outgrowth of the cuneiform characters, which are wedge-shaped, and are arranged in groups to express a thought. The simplicity of the Roman alphabet system, as compared with the Chinese may be appreciated when it is considered that a boy 10 years old in an American school has acquired the same facility in reading and writing English that would take a Chinese student 25 years to accomplish in the study of Chinese characters.

**5. The Arabic and Roman Numerals.**—Without a general knowledge of ancient history, it is impossible to form a clear outline of the history of writing, as one is inseparable from the other. In the period of several centuries between the Confusion of Tongues and the Exodus, it is known that the continents of Europe, Asia, and Africa were largely peopled; and, though Chinese legends in regard to their chronology point to periods much earlier than this, the system by which they have been transmitted, being based on object pictures, produces no evidence as to their reliability. The Hebrew writing, supposed by some authorities to be the outgrowth of the so-called Semitic writing, does not owe its origin to that early period, for there is sufficient evidence to show that the Hebrew alphabet did not come into existence until later. In the middle of the Semitic period, however, occurred the birth of Ishmael, from whom the Arabian race is descended, and to this race the present generation is indebted for the Arabic system of notation—1, 2, 3, etc. The system known as the *Roman* was in use much earlier, and probably originated in ideographic writing. The digits, I, II, III, IIII were originally pictures of the fingers; the V was shown by the whole hand, the fingers collected and

the thumb spread apart. The X was expressed by both hands together, each being in the position used to indicate the V. An increase or decrease of value was indicated by placing a digit before or after the V or X. This system is still in use for certain purposes, one of which is the numbering of the hours on the clock dial.

**6. The Hebrew Alphabet.**—The progress and development of all systems of writing are marked by national changes, and, therefore, when entering on a second historical period of about 1,000 years, beginning with the Exodus and reaching to the captivity of Israel and Judah, a nation of at least 3,000,000 people is found leaving Egypt and afterwards forming a most important element of the divisions of nations, and one strongly influencing the many systems of writing. To this great people, it is believed, was given an alphabet, and a language in laws and commandments, embodying civil as well as ecclesiastical polity. The most remarkable evidence of the purity of this alphabet is, that it has remained to the present time, surviving thirty centuries of the distinct racial life of this people; the only changes being in the present Hebrew characters, which assume a more square construction than the originals. From this nation also springs another system or alphabet—that of the Samaritans, but before considering this attention must be called to another country and people, the Phenician. The Israelites occupying Palestine were neighbors of this aggressive and thrifty people, and were brought into harmonious relations with them. The chief cities of Phenicia, Tyre and Sidon, were, during the reign of Solomon, maritime centers of great activity. It is assumed, therefore, that the Greek alphabet came directly from the Phenician, while the Phenician in turn was evolved from the Hebrew, Assyrian, Egyptian, and Moabitish.

**7. The Samaritan Alphabet.**—The Samaritan alphabet has Hebrew as a base, with a strong interspersion of Assyrian and Chaldaic. Israel, about the middle of this second period, was divided into two kingdoms, two tribes

constituting the kingdom of Judah and ten tribes that of Israel. The latter, as well as the Egyptians and Phenicians, suffered severely from the Assyrian and Babylonian invasions. These powerful eastern empires took captive the ten tribes of Israel, thereby causing their complete downfall and the loss of their national identity. The Mosaic laws prescribed that the soul that did not observe certain ceremonies after 8 days would be cut off from Israel; the ten tribes failed to observe these ceremonies as a nation, and therefore lost their identity in the Hebrew family. Subsequently, however, they returned to Samaria and adopted a



FIG. 1

revised Pentateuch. Mention is made of this to assist the student in understanding the origin of the Samaritan alphabet, which is so made up of others that little or no reference is usually made to its origin, bearing as it does so close a resemblance to the original Hebrew.

The only examples of the primitive forms of writing and of the earliest alphabets are to be found on monuments or in tabulated inscriptions, and on coins and fragments of utensils. Among these, the principal ones during this

period are the Baal-Lebanon Bowl (10th century B. C.), the Moabite Stone (9th century B. C.), the Siloam Inscription (7th century B. C.), and wall inscriptions of Darius Hystaspes (490 B. C.) This period closes with the captivity of the remaining two tribes in Babylon (about 600 B. C.) Prior to this period belong the hieroglyphic inscriptions, such as are found in Egypt on monoliths, pyramids, temples, etc., many of which are 4,000 years old.

**8. The Phenician Alphabet.**—The Phenician, as previously stated, is the source of the present alphabet characters; and the ascendancy and decline of the Grecian empire and the establishment of the Roman mark another period, during which the alphabet characters attained their present development, as shown by the inscription on the Arch of Titus, built 70 A. D., a representation of which is shown in Fig. 1.

**9. Analogical Conclusion.**—This recapitulation is sufficient to show that the modern phonetic alphabet came originally from the Hebrew, but descended through the Phenician branch. It is, therefore, generally believed that the alphabet characters have slowly evolved from hieroglyphic writings, first from syllabic signs, and that these forms must have been developed from verbal phonograms. The verbal phonograms were adopted from ideograms, which could have originated only from picture writing. Surrounded by the Hebrew and the Egyptian characters, and all other forms of writing, it is not surprising that the Phenicians should have constructed an alphabet of phonetic value, as well as simplified the characters by giving them a uniform stroke. This form of writing gave rise to the classic Greek. The name of every letter of the Hebrew has a special meaning, while the Greek names, though similar, are meaningless. For instance, the first four letters of the Hebrew and Greek alphabet are as follows:

HEBREW	GREEK
<i>Aleph</i> (ox)	<i>Alpha</i>
<i>Beth</i> (house)	<i>Beta</i>
<i>Gimel</i> (camel)	<i>Gamma</i>
<i>Daleth</i> (door)	<i>Delta</i>

**10. The Greek Alphabet.**—Several centuries of the Hebrew period elapsed before the Greek alphabet became an important factor in the formation of the Roman alphabet; in fact, not until after the fall of Greece as a universal empire. But as early as 880 B. C., there came with the birth of the Greek alphabet a most intellectual conception of literature, art, and architecture, of which the Latins were only imitators.

**11. The Latin Alphabet.**—Although the Greek alphabet still remains, evolution continues as long as the imperfect exists, and with the fourth universal empire came the Latin, or Roman, alphabet. As the Roman empire was composed of almost the entire civilized world, its alphabet was the mother of all modern styles of writing. The **Roman alphabet** characters of the 1st century are practically the same as the ones in use today, known by the names Egyptian, Antique Egyptian, and French Roman.

**12. The Renaissance.**—From the beginning of the Christian era, there seems to have been no apparent growth of the alphabet for many centuries. The dark ages were evidently a germinating or budding period, and, until the 15th century introduced an era historically known as the Renaissance, no progress whatever was made. About the middle of this century (1443) printing was invented, but it was many years before this important discovery accomplished much to benefit mankind; for it must be remembered there was no cheap material on which to print, the parchment used for engrossing being far too expensive for the purposes of printing. The process of printing had a very beneficial influence on the methods of writing, however, and incidentally on the alphabet itself, for the letters had become so elaborate by this time as to appear almost like ornamental enigmas. The process of printing necessarily required for the separate types the simplest forms of characters, and the printers were compelled, therefore, to return to the forms used during the 1st century. The Latin and Western Roman styles were

therefore used, the former being known at the present day as Antique Egyptian and the latter as French Roman.

**13. Ornamentation.**—It should be borne in mind that ornamentation in lettering such as marked the period just prior to the 15th century is not a requirement of the present day. The first principle to be observed in forming letters is simplicity, as the most important qualification of a letter is its legibility. Ornamentation plays an important part, however, in making letters attractive, and if not overdone may aid much in producing artistic effects.

**14. Results of the Renaissance.**—The Germans during the 15th century, then located in Northern Italy, were not slow to become imbued with the spirit of this new development in art; and Spain, France, England, and all Europe in fact, was affected by the great impulse, largely on account of the achievements of an Italian family known as the Medici. Previous to this, the art of lettering was confined almost exclusively within the monasteries. The ecclesiastical devotees, or monks, were skilful in the art of calligraphy, and exhibited wonderful dexterity in their work of designing and illuminating capital letters on their manuscripts, many of which are extant today. Their work shows great care and accuracy of execution; many of the illuminated capitals must have each taken several days to design and execute. It is to be regretted, however, that these early monks possessed a knowledge of chemicals for removing the inscriptions from earlier manuscripts from which they copied, thereby depriving the world of records far more valuable than their own. During this whole period prior to printing there were many varieties or styles of the alphabet originated. The style known at present as the Egyptian was originally known as the plain Roman, or the style in which the early Greek and Latin alphabets were written; while the Roman letter of the present day is almost identical with the Medieval Roman of the period indicated by its name. The Gothic, the earliest specimen of which dates back to 1349 A. D., was possibly the

next style and derived its origin from the ogival or pointed arch, characteristic of the Gothic style of architecture.

**15. Development of Modern Forms.**—The English, 1400 A. D. (specimens of which are still in Westminster Abbey), was possibly the outgrowth of the century Romanesque, the Old German letters follow closely on the Old English. Many of the German and Italian Renaissance styles still remain. The Script writing (ordinary cursive kind), out of which has developed the more graceful and classic curves possible to produce, was of Anglo-Saxon origin. The style known as French Roman having the horizontal strokes considerably narrower than vertical, the extremities of these being finished with antique spur, were, as has been previously stated, of century origin, and were used by the Western Roman printes. The Italic script is a modern interpretation of Medieval Italian print. There are several forms of Church Texts, which originated from the Old German as well as the Old English.

**16. Modern Styles.**—Of the styles of more recent date the style known as Rundschrift (round writing), which is an adaptation of the German Renaissance, was the invention of the German. Aside from this there are several styles known the world over as American writing; these are the Block, Half Block (both plain and antique), Railroad Block, Round Full Block, Spencerian Script, and Shippers' Marking. These styles are used chiefly by letterers, with the varieties in type which are of purely American origin so numerous as to prohibit any attempt to classify or to describe them. Their form and style are peculiarly identified with printing, and, with the exception of a few special styles such as Bradley Text and Post Old Style, they are seldom ever used by letterers and sign painters; while to the art of printing is due all progress made in the invention of styles of writing since the 15th century.

**GENERAL RULES****POINTS TO BE OBSERVED**

**17. To Properly Begin the Course.**—The few general rules following are very important to the student, and it is necessary, therefore, that they should be carefully observed and followed.

1. Do not begin to draw the plates until drafting instruments and such tools and material as are necessary have been obtained. Perfect work cannot be accomplished without the proper tools.

2. Do not attempt any form or style of letter other than the style furnished for each Lesson.

3. Do not allow the eye to dwell on that which is inartistic; for just as certainly as "evil associations corrupt good manners," so surely does association of the eye with that which is out of proportion, distorted, or irregular, leave an impression that is lasting in its effect, and by no means easy to dispel from the mind. When the student has advanced to the study of inscription designing and ornamentation, he will better appreciate the importance of this advice.

4. Do not become discouraged if you do not make as rapid progress as you would like. The assertion is often made that it is not possible for one to become a master of an art or profession without a natural talent for it; this may be true along some lines, but it is not true in regard to lettering, especially if behind the effort there is a patient determination to succeed. Concentration of thought and constant practice must, of necessity, accompany this determination.

5. In order that proficiency may be attained, it is necessary to practice constantly, aside from the practice gained in simply drawing the plates. The process is exceedingly slow by which the eye becomes trained in measuring distances by proportion and the hand overcomes its natural unsteadiness (often attributed to nervousness), and which bring these into perfect subjection to the will. There are



times, however, when, without explainable cause, the hand ~~is~~ is extremely unsteady. This may be overcome somewhat by allowing cold water to run on the pulse of the right wrist for a few seconds.

6. The dimensions of drawings, the size and construction of letters, must invariably conform to the requirements given in *The Formation of Letters*, beginning with Full Block, which is the first drawing plate in this Course. On the sheet sent in for correction, India ink only should be used, while practice work may be done with card black or water colors on any kind of paper. Do not send practice work to the Schools. A student's proficiency can be fully estimated from the regular drawing plates. Finished work or designs will be gladly received, however, and corrections and suggestions will be made on same, of great advantage to the student.

7. Give as much time to practice as possible: do not be satisfied to make a letter several times only, but practice each letter until you have mastered it, and have learned perfectly all the rules governing its construction in every characteristic line and stroke.

8. Be sure you thoroughly understand all the instructions pertaining to each plate before beginning on the work. Study the instructions carefully with the plate before you.

Strive to excel; despise mediocrity.

The advantages offered in this Course should induce every student to aim above a general knowledge of letters only, and to seek to retain a position equal to that occupied by the few that fully understand the many forms of alphabetic characters and all their applications.

9. Accuracy is more profitable than speed. Do not make the common error that the most important qualification of the beginner is to acquire speed. Speed comes only as a result of constant practice and of a thorough knowledge of the formation of letters. Therefore, make one letter perfectly rather than make a whole alphabet poorly by slighting the details of their formation. Take time enough to draw the plate to the best of your ability.

**18. Materials Required.**—When practicing or drawing in the evening, use a good steady light, and place it directly in the rear or to the left of the table on which you are working, and from 12 to 18 inches above the work, while the eyes should always be protected from it by means of an eye-shade. It is very important that the table on which the drawing is to be done should be level and firmly constructed. Those students who enrolled without the Outfit should provide themselves with all tools and materials necessary as early as possible. Perfect work cannot be accomplished unless the proper tools and materials are used. By writing to the Technical Supply Company, Scranton, Pa., a list of the contents of Outfit may be had, and, such tools and materials as are required, and not already possessed by the student, may be ordered from them.

**19. For Students in Sign Painting.**—Draftsmen and other students interested in a similar class of work will find these tools sufficient for practice and specimen work. But the students that wish to apply a knowledge of lettering to sign painting are advised to do the practice work on cardboard or manila pattern paper, using various sizes of camel's-hair brushes, and card black, the preparation of which will be given hereafter. By drawing six horizontal lines, making the spaces between them equal, and using the points of the compasses for width of stroke and of letters, the letters can be made uniform and of any size, but the plate sent in for correction must invariably be on drawing paper 15 in.  $\times$  20 in.; the drawing itself should be enclosed within a rectangle 8 $\frac{1}{2}$  in.  $\times$  15 in.

## DRAWING THE LETTERS

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### MECHANICAL AND FREEHAND DRAWING

**20. Drawing** is the art of representing objects on a convenient surface, such as paper, by means of lines or colors, or by both. The representation of an object in this manner is called a *drawing*. If the pencil, brush, pen, or marker by which a drawing is made is guided wholly or partly by instruments, as, for example, by a straightedge or by compasses, the drawing is called an **instrumental, or mechanical, drawing**. If no instruments are used, and the lines drawn by the free use of the hand, all dimensions being laid off by eye only, the drawing is called a **freehand drawing**. A rough preliminary or unfinished drawing is usually called a **sketch**.

**21. Purpose of a Drawing.**—The purpose of a drawing is either to assist the memory or to convey to others an idea of the shape, size, combination, form, color, or appearance of some object. Drawings also aid in perfecting ideas when designing or inventing. The practice of freehand drawing trains both the hand and the eye. It enables one to estimate distances and lay them off on a drawing correctly, and to compare the relative sizes of angles, lines, and figures in general. It thus trains the hand to draw better and more rapidly with instruments. The ability to draw well in freehand is one of the most useful of accomplishments.

**22. Mechanical and Freehand Lettering Plates.** There are but two plates or styles in this Course that are in the true sense mechanical styles, that is, made exclusively with the aid of a straightedge and other instruments. These are the Full-Block plate and the Half-Block plate. The others are made up of straight lines and curves. These curves,

though slight in many cases, are all drawn by the free use of the hand, and therefore, freehand drawing entering into their construction, they may be classified under this head. The use of the straightedge, however, is recommended in making all straight lines, whether in mechanical or freehand styles, but not the use of compasses in making curves in freehand letter styles, unless a perfect circle is required.

The student is required to rule the guide lines for letters on the first few plates for the following reasons: It is a matter of economy in time, as the outlines for the letters are thus made with one continuous stroke of the pen; it also gives the student practice in mechanical drawing and a knowledge of the exact formation of each letter in every detail. In outlining the letters, all straight lines should invariably be drawn with the ruling pen, and the curved strokes with the point of the No. 3 red-sable brush.

#### COMPONENT PARTS OF A LETTER

**23.** The **stroke** is the term applied to the width between the outlines forming the letter; when applied to letters possessing more than one width between its outlines, it always refers to the greatest width, and usually to the vertical portion of the letter, as distinguished from the *fine line*.

**24.** The **fine line** is the line that connects the strokes or the lines attached to them, forming a part of the letter, and is usually a horizontal line.

**25.** The **spur** is a small projection from the extremity of a letter, and exists in several varieties, according to the style of letter on which it is used.

**26.** The **face** of a letter usually includes all the space within the outlines forming the letter.

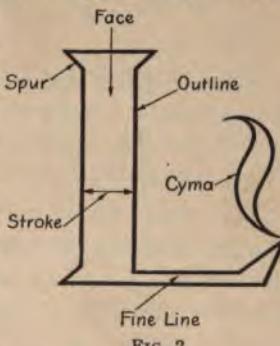


FIG. 2

**27.** The term **shade** is used to describe the treatment or finish of a letter—that embellishment that is applied to a letter to give it the appearance of standing out from the background, or to cause one part of a stroke to seem projected or depressed from the surface. The shade may be added to the letter or be placed on its face.

**28.** The **block** is similar to the shade in effect, and is used to give a letter thickness, or, as its name implies, to give it a solid block effect, in which case the shade is sometimes carried beyond the block in the form of a natural shadow.

**29.** The **outline** of a letter is the line that forms the letter, leaving the body of the stroke open.

**30.** The **width** of a letter is the space between the vertical lines to the extreme right and left; the term never refers to the height.

**31.** The **background** is the surface on which the lettering is placed; it is also sometimes called the *ground* or *field*.

**32.** **Condensing** is a term applied to the closer spacing of the letters, or to making them narrower than their normal width.

**33.** **Elongating** is the term used when the letters are drawn out to a greater width than the normal. This term should not be applied to the appearance of a condensed letter, connected with the relation of its height to its width.

**34.** The **cyma** is a character employed to equalize the spacing between irregular letters by placing it where the space is so open as to require something to make the word appear solid. This character derives its name from the Greek, its undulating form resembling a wave. The cyma is usually attached to the letters A, L, M, W, etc.; it is used in but few styles of lettering, though in some styles it forms a part of the letter itself.

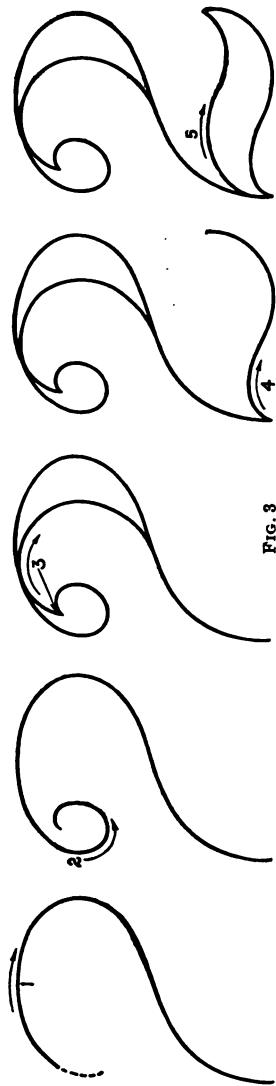
## LETTER FORMATION

## GENERAL CONSTRUCTION

## 35. Rules for Outlining

**Letters.**—There is a principle on which every letter is constructed, and when this is once learned, the subject of letter formation has, to a great degree, been mastered. The letters should be formed with as few strokes as possible. For this reason, the student should learn to make strokes with one well-directed sweep of the pen or brush, covering as large a portion of the outline of a letter as can conveniently be accomplished. To do this successfully, the letterer makes the beginning of the curved stroke the starting point, when it is possible to do so, and completes the stroke at a point where the pen or brush may be removed without cramping the fingers. For example, the 2 shown in Fig. 3 should be constructed with five distinct strokes, and in the directions indicated by the arrows. Stroke 1 begins at the point *x* and finishes on the base line; stroke 2 completes the ball at the upper left-hand point of the figure; stroke 3, beginning at the outline of the ball, merges gracefully into stroke 1; stroke 4, at the base of the figure completes one half of a cyma; and stroke 5 completes the other half of the cyma. The result is a perfectly formed figure 2.

FIG. 3



Do not attempt to draw one of these strokes with several short ones; symmetrical curves can never be drawn in that way. It is essential, therefore, when practicing, to follow the entire line of each motion of the illustration. This may be quite difficult at first, but the ability to do so is soon acquired, and the economy in time effected when lettering in this way will be of inestimable value.

**36. Outlining Mechanical Letters.**—There is a certain order that must be observed in constructing letters of alphabets of the mechanical order. Every stroke is always made in its regular order by an expert letterer, by drawing first those lines that limit the width of the letter, and then the lines that limit the width of the stroke, beginning with the left stroke. In marking out a sign board for lettering,

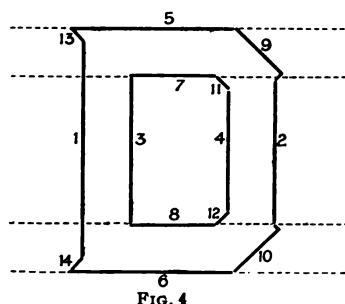


FIG. 4

horizontal lines are usually drawn with a lead pencil or with pencil compasses, after which the vertical lines are drawn. The same order is observed in drawing the horizontal outlines of letters, the top and bottom lines being first drawn, the upper inside lines next, and then the lower

inside lines. Bevels and spurs are added, as shown in Fig. 4. Thus, in the block or mechanical letter D, there are fourteen strokes. In outlining a word, a letterer has many things to keep in mind: the width of letter, width of stroke, space between letters, characteristic features of alphabet, uniformity in width of stroke, and outline. Aside from these, it may be added that he must be careful to make letters absolutely vertical, and he must watch his orthography and punctuation.

**37. Direction of Outline.**—In the formation of a letter, it is very necessary that the student should observe the proper direction in which strokes should be drawn. In using a brush, the hairs must be drawn so as to be kept together, always bringing them to a point. The brush must

not be pushed toward the point, nor twisted so as to separate the hairs if the best results are desired. Therefore, all strokes made with a lettering brush should be downwards in vertical strokes and from left to right in horizontal strokes. If this instruction is followed, it is not necessary that the direction of the strokes should be indicated by arrowheads. The same rule applies to curved strokes. In making a right or left crescent stroke, as in the letter O of the Roman alphabet, the first stroke begins at the top and finishes at a point where the second stroke may be joined to the best advantage, as shown in Fig. 5.

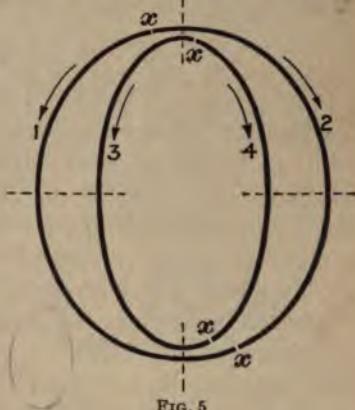


FIG. 5

**38. A Point to be Observed.**—It would not occur to a beginner that in making a freehand letter it is necessary to observe anything further than the symmetrical outline of the letter.

But the experienced letterer, whose eye is trained to note measurements within and without a letter, finds that the space within the letter should form a perfect ellipse. He therefore endeavors, in making a perfect outline, to construct also a true ellipse or circle within the letter. This principle is embodied in a great many letters and figures. While the ellipse or circle is not

entirely shown, yet it is complete so far as the outline of the letter extends, and were it completed with dotted lines the student would readily see to what extent this principle enters into the construction of many letters. Fig. 6 fully illustrates

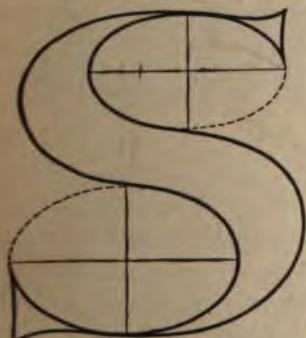


FIG. 6

this latter thought. The upper and lower inner portions of the letter S are elongated ellipses; in Fig. 5, also, the interior of the letter O is seen to form a perfect ellipse.

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#### MARKING OUT LETTERS

**39. Use of Compasses.**—It is recommended that a student, in lettering, learn early to rely on the points of the compasses in marking out and spacing letters. An attachment that holds a lead pencil and is fastened to a leg of the compasses with a setscrew is found to be a very convenient tool in lettering. If the letters to be marked out are of the mechanical order, six horizontal lines may be drawn, making five spaces of equal width. If Full Block letters are used, set the compass points to the height of the letters, which should also be their width, exclusive of spurs. First, measure off the space to be lettered with the points of the compasses without marking the surface, in order to ascertain if the word or inscription will permit of the use of letters of normal width. Having done this, proceed by pointing off, approximately, the spaces the letters are to occupy. Then space them accurately and mark them lightly, and if they are found to be correctly spaced and located, the lettering may then be permanently executed. For all freehand letters, only the two horizontal lines required to limit the height of the letters are necessary.

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#### SPACING

**40. Importance of Spacing.**—Next in importance to the formation of letters stands the art of arranging them in words in such a way that the word will be not only legible, but properly related to the adjoining words; this is called **spacing**. Nothing will destroy the harmony of a line of perfectly formed letters more effectually than a disregard of this. Aside from a few general rules, the letterer must depend on his own good judgment, and cultivate the ability to properly space his words and sentences. Irregular combinations occur in many ways, but true proportion must

always reign in a word accurately spaced, so that its regularity is apparent to the eye at a glance. To accomplish this, special attention must be given to the following rule: Make the interspaces equal to one another in area, or as nearly so as possible. To do this may require the bringing of some extended letters closely together, and the spreading apart of letters having adjoining vertical or parallel strokes.

**41. Correct and Incorrect Spacing.**—The spacing of letters having slanting strokes is shown by Figs. 7 and 8,



FIG. 7



FIG. 8

in which the right and the wrong spacing can be seen. The L in Fig. 7 is a full stroke narrower than the normal width of the letter; and the space between the A and the W is about one-half the width of the letter A at its base. At the top of the A is shown the cyma, sometimes used to relieve the space which cannot be equalized. The cyma is often used also in a vertical position on the L, the point



FIG. 9



FIG. 10

almost resting on the lower right-hand spur. Fig. 8 shows the effect of the rule followed by some letterers, who allow the same space between the extremities of all letters, and make no allowance for unequal interspaces. The parallel strokes of the A and the W are the same distance apart as the L and the A, leaving the L full width. Many such combinations occur, and, unless great care is observed, no better effects may be expected than that shown in Fig. 8. Two projecting letters, either L's or T's, often occur together, as in such words as millinery or butter, and at the same time in connection with letters that are of full width top and bottom,

as shown in Fig. 9. In such cases, the L should be ~~made~~<sup>de</sup> a stroke-width narrower than the full-face letters, and ~~the~~<sup>de</sup> spaces between the latter and the right-hand letters next to them should be one-half the width of the stroke. There should be a space of the full width of the stroke between parallel-stroke letters, as the I and the L. In Fig. 10, the T's are shortened only one-half the width of the stroke, allowing the same space between them and the letters on each side as allowed in Fig. 9 between the end of the right L and the stroke of the N. The letters, therefore, that will cause the most difficulty in spacing are the slanting-stroke letters A, K, V, W, and Y and the projecting letters F, J, L, and T.

**42. Full Block and Roman.**—When spacing such styles as the Full Block and Roman, observe the following rules: When two letters having spurs come together, as

The image shows the letters 'H' and 'E' in a bold, blocky font. The 'H' is a standard outline 'H'. The 'E' is a standard outline 'E' with a vertical stroke on the left and a horizontal crossbar.

leave the width of the stroke of the letter between the spurs.

When a spur and a plain-stroke letter come together, as

The image shows the letters 'H' and 'O' in a bold, blocky font. The 'H' is a standard outline 'H'. The 'O' is a standard outline 'O' with a circular body and a vertical stroke on the left.

leave one and one-half width of stroke between body or stroke of letters.

When two spurless letters, as

The image shows the letters 'O' and 'S' in a bold, blocky font. The 'O' is a standard outline 'O' with a circular body and a vertical stroke on the left. The 'S' is a standard outline 'S' with a diagonal crossbar.

come together, leave space of one stroke between them.

With slanting-stroke letters, such as the W and the Y, leave the half-stroke space between the spurs, and the same space if the next letter be a spurless letter.

**43. Egyptian, Half Block, and French Roman.** The Egyptian, Half Block, and French Roman can be spaced by the following rules: Leave width of stroke between all parallel-stroke letters, and one-half this width between projecting letters.

Between round letters coming together on rounded sides, as



leave one-half stroke. Between words, never allow less than the space of a full-sized letter, including spurs; if possible, leave a space and a half. Never allow letters to touch each other, except shaded letters, and not then unless it is unavoidable.

Two round letters coming together, such as



in condensed styles, having no spurs, may be allowed to almost touch each other without having the effect of doing so; while such letters as



produce the effect of being closer together than they really are.

**44. Compact Spacing.**—Care must always be exercised in selecting a style of letter to suit a space as well as a word. The placing of a word in a space not appropriate to it will cause the letters to be either so separated by spaces or so crowded for want of space as to make them unsightly and difficult to read. Under the heading of *Inscription Designing*, Art. 87, the subject of the selection of styles to meet all requirements is fully treated. The appearance of an improperly spaced word is similar to that of an improperly spaced company of soldiers. If a portion of the company is

separated by a space greater than the manual prescribes, it has the appearance of a separate detachment and is noticeable at a glance. In the same manner, if a word is spaced properly throughout with the exception of one letter, it has

# SENATE

FIG. 11

the appearance of two words. For example, take the word shown in Fig. 11, in which the space between the N and the A gives the effect of two words.

## SHADING

### RULES FOR APPLYING SHADING

**45. Shading on the Left Side.**—Shading is used to cause the letter to appear in relief, and thereby take away the flat or plain appearance. Shading may be placed on the top, bottom, or either side of a letter, but it should at first always be placed on the bottom and left side; as, for several reasons, it is best not to try to shade a letter on the right side until the student is familiar with the left, as he will use this side for all



(a)



(b)

FIG. 12

practical purposes. The reasons for giving the left side the preference are: (1) Regularity and symmetry of shading is given to a larger number of letters when the shading is on the left side, as in the letters S,

E, C, R, etc. Fig. 12 illustrates this advantage, and shows the single stroke on the left at (a), and the broken shade from the stroke on the right side at (b). (2) By shading to the left, the letterer can accomplish more in a given length of time, and produce a better effect in his work when finished. (3) The majority of strokes in shading to the left are drawn toward the letterer, while in shading on the right the brush is

pushed to the right, which in itself is a strong argument in favor of the former.

**46. Direction of Shade.**—Shading should always be executed on the assumption that the light falls on the letter at an angle of  $45^{\circ}$ . This principle can best be shown by reference to Fig. 13. The maximum width of the shade occurs at *a, a*, midway between the two lines *b, b*, and then diminishes to lines *b, b*, where it is completed. The tendency of the average letterer is to give too much thickness where shade begins or finishes. All letters must be shaded at the same angle at every point of a letter, and, after practice, this angle becomes as well established with the letterer as the horizontal or vertical lines. Every characteristic point of the letter must be shown in the shade, as at *a*, Fig. 14, and all must be of equal width in all letters except the round characters, whereon the shade reaches this width only at the maximum point of thickness in the letter.

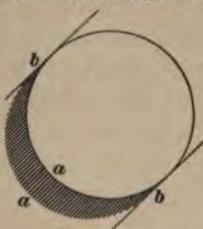


FIG. 13

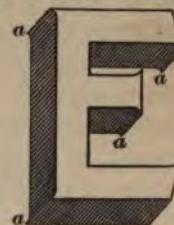


FIG. 14

**47. Width of Shade.**—The width of the shade must



FIG. 15

invariably be governed by the width of the stroke of the letter. If the stroke be  $\frac{3}{8}$  inch wide, the shade should not exceed two-thirds of this, or  $\frac{1}{4}$  inch in width. No difference in this respect should be made, whether a space be left

between the letter and its shading, or the shade be placed next to the outline of the letter. In Fig. 15 is shown the relative width of the shade to the stroke when used in either way referred to.

Where two or more shades are used, the width of each shade should not be more than one-half that shown in Fig. 15, or  $\frac{1}{8}$  inch if the stroke of the letter is  $\frac{1}{4}$  inch wide. If three shades are required, the strongest or darkest shade should always be placed nearest the letter, and the shade farthest away should be a tint; or if colors are used, it should always be a *natural shade*, that is to say, a color as nearly in imitation of the shadow cast from an object on a white or colored surface as may be secured.

**48. Plain Shading.**—The simplest form of shade is that which is joined to a letter on its left and bottom outline,

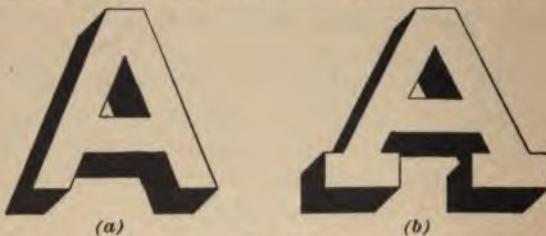


FIG. 16

and it is usually black or dark colored. To shade letters in this manner, draw a Half-Block letter A, also a letter A of the Full-Block alphabet. Make the letters  $1\frac{1}{4}$  inches high and of the same width as that shown in the drawing plates. Outline the letters, but do not fill them in. Before beginning to shade the letters, read the instruction on the use of the protractor given near the end of this Section, which explains the method of ascertaining the incline of a line in degrees; also, learn from the article on the T square and triangles the difference between the  $45^\circ$ ,  $90^\circ$ ,  $60^\circ$ , and  $30^\circ$  shown on the two triangles included in the equipment for this Course. Having done this, proceed to shade the letters shown in Fig. 16. The stroke is  $\frac{1}{4}$  inch wide, therefore the width of the shade should be three-fourths of this, or  $\frac{3}{16}$  inch. As the

width of the shade is changed because of the incline of the stroke, the only place where the regular width of the shade is shown is on the bottom of the horizontal outline of the letter. By drawing the  $45^{\circ}$  lines from the lower corner of (a), Fig. 16, it will be noticed that the shade, in order that it may join at the proper angle, is diminished by one-third its width in the left slanting stroke and increased by one-third in the right stroke. The shade on slanting strokes should always be uniform in width and parallel with the outline of the letter. In Fig. 17 is shown the plain shade on such

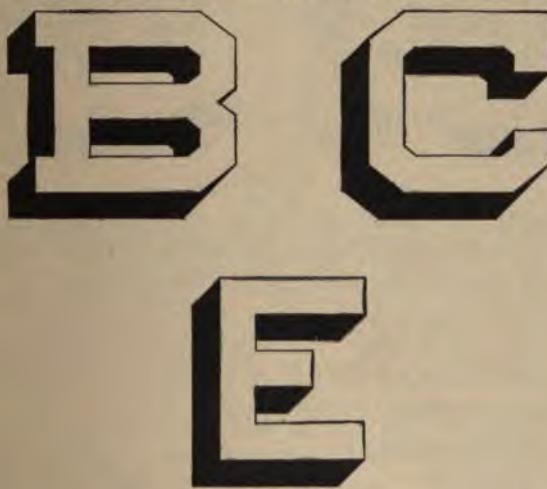


FIG. 17

letters as will best serve as guides in shading the others. It will not be necessary, therefore, to repeat the principle once given. The shade should be shown at every angle, no matter how slight this may be, as seen at the bevel on the lower portion of letter B and also on the short stroke in the lower portion of letter C.

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#### SHADING WITH COLORS

**49. Two-Color Shading.**—In shading with colors, a light color is often placed on the side of vertical strokes and a darker shade of the same or a different color at the bottom

of letters underneath all horizontal strokes. If all letters were formed by right angles, no further instruction on the subject would be necessary. Many letters are cut off in their outline with a bevel. In shading such letters, it becomes necessary to follow some plan that will clearly show the bevel in the shading. There are two methods of accomplishing this, as shown in Fig. 18: The letter R illustrates the blended



FIG. 18

shade, and G the divided shade. In either case, the dark color must be placed against the light shade, and the light shade against the dark or bottom shade. When yellow is used for a side shade, yellow and umber mixed, or burnt sienna, is used for the dark shade. Vermilion for a side shade requires Indian red or carmine for a dark shade; other colors simply require a darker shade of the same.

**50. Block Shade.**—There are many methods of obtaining beautiful effects in shading, which will be considered separately. The **block shade**, as its name indicates, consists in making the letter appear to have thickness, or in representing the letter as cut out of a thick board, and thus making it a relief letter. This is done by the use of two shades, the

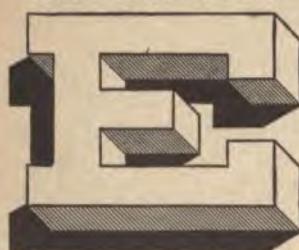


FIG. 19

darker or stronger one being used underneath all horizontal strokes, and the lighter tint on the side of all vertical strokes. The block shade can be placed on the top, left, or right side of the letter, in which case the block, as well

as the letter itself, is shaded as shown in Fig. 19. Here the letter has the appearance of casting a shadow downwards and to its left. Two or three natural shades may be used to give the shading that falls from the block a more natural appearance.

**51. Cast Shadow.**—The cast shadow is also used in connection with heavy-stroke letters, block shading, etc.,

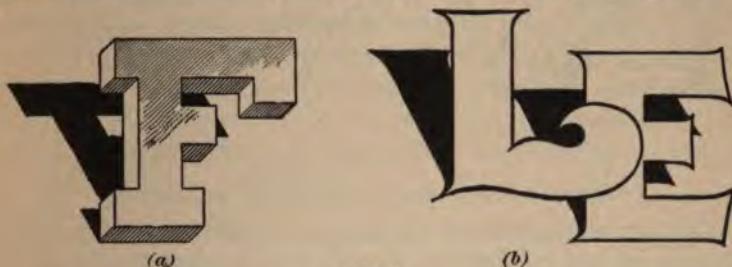


FIG. 20

giving the letter the appearance of standing upright, either on a level or on an inclined surface. The top of the shade is on a line about one-fifth of the height of the letter below the top. The shade is made at an angle of  $30^{\circ}$  to the left, the point resting on the lower left corner of the letter, as in Fig. 20, where (a) shows the letter with a block shade and cast shadow, and (b) shows the simple outlined letter and cast shadow. The shade is sometimes used by duplicating the letter in the form of a shadow cast on the background, one-fifth of the height of the letter below the top, and at the same angle, that is,  $45^{\circ}$  degrees, as the regular shade, as shown in Fig. 21.



FIG. 21

**52. Relief Shade.**—Relief shade is obtained by leaving a space between the letter and the shade at the same angle as the shade, as shown in Fig. 22, making the space and shade of uniform width. When used in connection with block shade, it is often of the nature of the natural shade,

and is added to the block shading without any line or space between. The relief shade, when used as a natural shade on a white or tinted ground, is made to represent the strength

of the shadow cast from an object on the ground on which the letters are placed. By placing the finger on the surface of white paper, the strength of the natural shade may be seen. This shade is produced with the pen by means of lines, but more effectively with the brush and transparent color.



FIG. 22

#### LETTER-FACE LIGHTING AND SHADING

**53. Importance of Subject.**—In the foregoing, consideration has been given to the exterior treatment or shading of the letter. Attention will now be turned to the interior, or face, treatment of a letter. This likewise is subject to diverse and artistic embellishment. The letterer often finds himself confronted with a line of extremely plain lettering that, even after it is shaded, remains flat and unsatisfactory. This unfinished appearance may be overcome by the addition of lights and shades placed directly on the face of the lettering. The work placed on the face of the lettering may be variegated or blended from a light to a dark shade, in which case a sharp outline must surround the entire letter, as shown in Fig. 23. Lighting and shading are used with



FIG. 23



FIG. 24

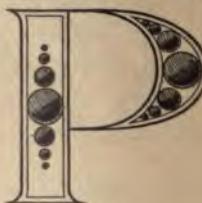


FIG. 25

best results on heavy-faced letters, as nearly all treatment of the face of a letter by shading has the tendency to considerably reduce the apparent width of the stroke.

**54. Effects Produced.**—Another effect is produced by running bars of color across the center of the letter, and diminishing these bars in width to a point midway from center to top and bottom, as in Fig. 24. Diminishing circles are also used on letters of lighter face, such as the Roman, and can be made to occupy the entire face or, as is shown in Fig. 25, terminate at a given point, which must be regularly observed throughout the line of letters. For practice, the student is advised to outline the letters shown in Figs. 23, 24, and 25, using yellow and umber for letter B; a light tint of blue for filling in letter D, making the bars across the letter of dark blue; for the letter P, fill in the letter with light green, making the balls of dark green and shading them so as to give them a relief effect.

**55. Heavy High Light.**—The heavy high light is used in the treatment of the face of the letter by making the upper half of the letter uniform in tint, either by lining, as shown in Fig. 26, or with colors. The darker shade *b* is placed on the lower half of the letter, allowing the high light on this to remain of equal strength to *a*, or the

upper half. The high light *c* on the upper half of the letter is left white. By a combination of the shades of colors many beautiful effects can be produced, using such colors for *a* as blue, green, gray, or gold color, the last of which combines with sienna for the lower portion, and with cream color for the upper high light. Blue or green, when used, should have tint and shade of the same color. On the colored Drawing Plate, title, Color Shading, this subject is shown in the letter W on a black panel.



FIG. 26

**56. Beveled Shading.**—Shading on the face of a letter to give it a beveled appearance is another treatment that

lends to a line of lettering a finished and pleasing effect. In this process, it is necessary only to observe the rules of light and shadow, as shown in Fig. 27, by shading the letter on the left and bottom sides from a line drawn along the center of the face of the letter.



FIG. 27

This form of shading is often applied to a gold or silver letter by the use of transparent colors, such as varnish stained with asphaltum, used on gold, and varnish darkened with lampblack, used on silver letters. There are many other methods of treating the face of lettering by the use of ornament, whereby it loses its identity as plain lettering and becomes ornamented lettering.

On the Drawing Plate, title, Color Shading, the beveled shading is illustrated in colors, showing the treatment, in regard to strength of colors, necessary for various backgrounds.

#### THE HIGH LIGHT

57. As its name indicates, the **high light** is used to illuminate or light up a letter, which it does with wonderful effect. The high light is placed on the edge of the letter, opposite the shade, or to the right and on the top of the strokes. It is always a fine line of gold, silver, white, or cream, according to the color of the letter on which it is to be placed. If the letter is a colored letter, gold or silver can be used. If the letter is gold, nothing will serve the purpose of a high light so well as cream or white. On silver or aluminum, white only can be used. To be most effectual, this high light must be a fine line. The heavy high light is used in letter-face lighting and shading, and is explained under that head.

#### CUTTING IN LETTERS

58. **Uses of Cut-In Letters.**—The term **cut in** is applied to that style of treatment in which the letters are drawn in outline and the background is filled in around them. In inscription designing, this method is frequently resorted to, in order to break the monotony of several lines of

plain lettering. The insertion of a panel of ribbon on which the letters are cut in provides a colored background, against which the letters are outlined, allowing the same color for the letters as the main ground of the inscription design, as shown in Fig. 28. The color of the panel and background



FIG. 28

will govern very largely the character of the letter to be cut in. If the general ground is white or of any light color, and the cutting-in or outline color is very dark, a heavy-faced letter may be used without causing any appearance of clumsiness or false proportion. But should the letters be in gold, a much lighter-faced letter would be necessary, as the effect of the gold luster is to make the letter appear larger than it actually is. A very fine line of gold on a black ground can be readily distinguished, even at a great distance, and a white letter on a blue ground can be read at a greater distance than is possible with any other combination of colors.

When the sign painter or designer applies this method in gilded signs, he first letters the sign roughly with slow size, and the following day lays on the gold leaf. After rubbing the gold with a bear's-hair brush, it is burnished with cotton batting; then the sign is ready to cut in. Black (best refined lampblack) mixed with boiled linseed oil, a small lump of white lead (ready mixed), and a little coach japan form the cutting-in preparation that is generally used. The letters are trimmed up and the background filled in evenly, and then, before the black is dry, smalt is thrown on, making an even ground.

**59. Points to be Observed.**—In the practice of cutting in letters, the student should begin on the plainer styles, such as the Full Block, Half Block, etc., before endeavoring to execute the Roman or Script. Fig. 28 shows the letters in

outline, and also with the background filled in. In order to insure uniformity of width in the horizontal elements of the letters, faint lines may be drawn through the entire word by means of a thread or string charged with charcoal, chalk, or other material that afterwards may be readily dusted off. Cut-in letters may usually be permitted to stand closer than other styles of work, as they are seldom shaded, though, when they are shaded, the regular spacing should be used.

**60. Irregular-Surface Lettering.**—Where letters are cut in on an irregular surface, such as a ribbon, as in Fig. 29,



FIG. 29

they must be maintained at a uniform angle and not changed to suit the angle of the ribbon, as at *a*. The importance of this will be considered more fully later, but its connection with the subject now under discussion must not be overlooked. When letters are cut in on an inclined panel or



FIG. 30



FIG. 31

ribbon, they should be maintained in a vertical position, as in Fig. 30, or made perpendicular to the lines of the panel, as in Fig. 31.

## CLASSIFICATION OF LETTERS

## ORNAMENTAL LETTERS

**61.** Scope of the Subject.—The plain letters include all alphabets in which no line or curve enters that is not absolutely necessary to show their form or outline; a line thus added may place them among the ornamental letters. Although it will be impossible to go over the entire ground covered by this subject, as there are endless varieties of ornamental letters, the styles found to be most essential will be considered. There are many letters into which ornamental construction enters but slightly, while others are composed entirely of ornamental forms.



FIG. 32

The ornamental letters of most value to the student are those on the face of which the ornament appears either in the form of relief scrolls, geometrical figures, or designs in arabesque.



FIG. 33

**62. Ornamental Forms.**—Letters classified as ornamental are of so great a variety that such as are used in connection with the shade to produce a bent or rounded effect, as shown in Figs. 32 and 33, might be classed with this style. Fig. 32 shows the ground to be a plane

surface and the letter bent or warped, while Fig. 33 shows the letter to be perfectly straight, and fastened with screws, while the ground has the appearance of being bent or warped.



FIG. 34

A letter that in itself is perfectly plain, but is surrounded by ornamentation, as shown in Fig. 34, is also called an ornamental letter.

### 63. Other Forms.

Other ornamental forms are as follows: The relief-ornament letters shown in Fig. 35 can be made in various ways. The whole form of the letter may be treated in this manner, as at



FIG. 35

(a), or by simply suggesting it at the middle or edge of the letter, as in (b), (c), and (d). A letter may be plain so far as its face is concerned, but its form and construction may classify it as ornamental, as shown in Fig. 36.

There are many forms of design used in letter-face ornamentation, either filigree work, geometrical designs, or combinations of both. In Fig. 37 are shown three letters of the face-ornament class, the one at (a) being decorated with filigree work, while (b) shows a geometrical design, and (c) simply the cross-line shading.



FIG. 36

## GROTESQUE LETTERS

64. **Various Forms.**—All letters, as previously stated, are either plain, ornamental, or grotesque. The first two



(a)



(b)



(c)

FIG. 37

classes follow, in their outline construction, the forms of the fundamental styles and their many variations, but the third class is entirely different. The **grotesque letters** have no recognized or classical form, such as would place them among the definite styles of the alphabet, but are made by using natural objects, which are arranged so as to conform to any regular or irregular outline that will represent a letter, and any form, therefore, is allowable so long as the letter may be recognized. To accomplish this, objects such as a human figure, a piece of rope or ribbon, broken boards, leaves, vines, branches, and trunks of trees, are used. Of the three latter forms the



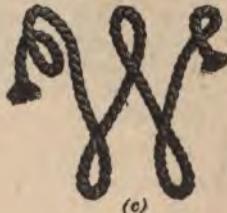
FIG. 38



(a)



(b)



(c)

FIG. 39

**Rustic letters** are made. The leaves, tendrils, stumps, and trunks of trees may form the material for an entire alphabet, one letter of which is shown in Fig. 38. These letters can

be made very artistic, and may show great skill in the arrangement. But, while they may be pleasing to the eye, they are of no practical importance to the student in the study of the forms of the letters, as their proportions are purely arbitrary. Fig. 39 shows the forms of some of the grotesque letters, in which (a) is formed by a human figure, (b) by broken boards, and (c) with a piece of rope. An alphabet may be constructed of these forms, as the fancy of any artist may dictate, even though he may be ignorant of the true form or proportion of the simplest style of the alphabet set.

#### ILLUMINATED CAPITALS

65. History and General Use.—The monks of the monasteries

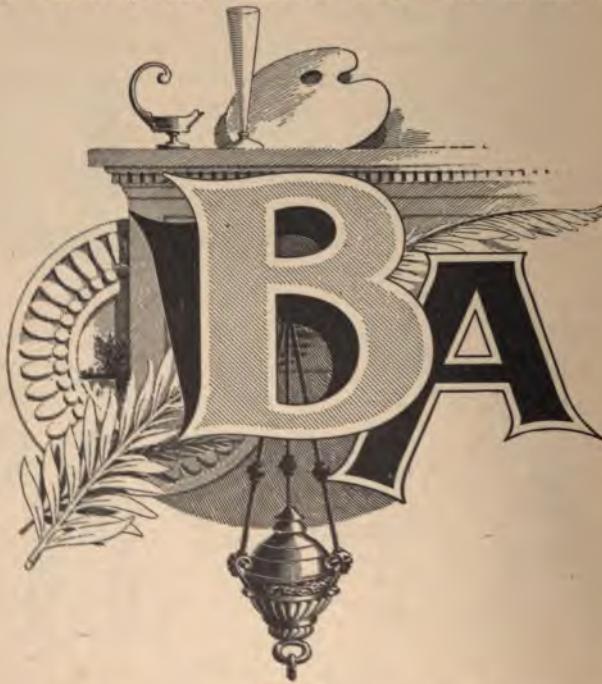


FIG. 40

middle ages were the first to make use of illuminated capitals, many specimens of which indicate that they must have spent

several days in designing and executing a single letter. In treating this subject here, the purpose is simply to call attention to the most simplified forms of illuminating, especially those forms designed for the use of the average letterer. The practical use of this art is now confined to lithographing, engrossing, card work, and ecclesiastical decorations. The printing and lithographing artists have displayed wonderful skill in recent years in illuminated work, especially on show-bill designs. The use of colors to light up the capital letter gives a surprising effect to a complete line of lettering, and is done by a simple combination of designs of the most harmonious colors with the letter or panel on which the letter is placed. The color work is executed in the boldest manner, so as to give it greatest prominence, by using colors in striking contrast to the tints used to form the background. Such colors as can be combined to give a brilliant effect are used in the form of a plaque or part panel, or of both, on which the letter is brought out most conspicuously, as shown in Fig. 40. The illumination practiced by engrossers is usually of such a nature as to produce a finished and pleasing effect without resorting to colors. There are many ways by which this can be accomplished. One method is simply by the use of a pen and black ink, as shown in Fig. 41, outlining the letter first, and then making the ornamentation surrounding it conform to any desired design, thereby giving the letter prominence. Great care should be taken that the ornamentation is not made more pronounced than the letter, but rather that it is used as a means to bring out or illuminate the letter.



FIG. 41

**66. Card Work.**—For **card work**, the illuminating of capitals gives tone and finish, and relieves a show-card of extreme plainness. For practical purposes, such as attractive

advertising cards, banners, etc., the illuminating of capitals will be found to hold an important place, and is coming into favor and more general use. There are also many forms and designs employed as a panel, on which illuminated capitals



FIG. 42

are placed, in a solid or outlined letter; the outline letter, however, being the most convenient, is most frequently used, especially when either the panel or the letter, or both, are to



FIG. 43

be treated in water colors. The letter outlined is sometimes filled in with carmine or some other bright color, while the panel surrounds it with a tint of cream-white, yellow, or green. Two or three shades of color are sometimes used, either variegated or in the form of line work on the top of the tint, as in Fig. 42.

**67. Ecclesiastical Decorations.**—For ecclesiastical decorations, such as wall panels containing inscriptions, which are usually in the Old English, Gothic, or Church Text style of letter, as well as for display mottoes in schools, halls, etc., where the Old English or other suitable lettering is used, the first capital (and sometimes all capitals) is illuminated on a panel of either gold, silver, or color. In all cases, the panel is made to conform in a general way to the letter, as Fig. 43 shows. If gold or silver is used for a ground, the letter must be of a dark color. If a colored ground (which is preferable) is used, a gold or silver letter will be found to light up with colors and produce a most satisfactory result.



FIG. 44

**68. Heraldic Shield.**  
A heraldic shield is often brought into use on which the illuminated capital is placed. There are many designs or forms of this shield, which can be changed to suit any form of a letter, as shown in Fig. 44.

#### INITIAL LETTERS

**69. Practical Examples.**—The letterer, as well as the printer, has use for novelties in initial letters or capitals. There is a great demand at present for designs of this character. Type makers, art embroiderers, and art printers often pay well for original and artistic productions. It is therefore a matter to which the attention of a designer may be directed with profit. The greatest need that the letterer has for initials is found in show-card writing, society-banner inscriptions, and engrossing.

**70. Suggestions.**—In Fig. 45 is shown a letter A formed by the use of a familiar object—the stand, having a shelf that makes a crossbar for the letter. This style of initial is often

employed, and many familiar objects are used that may be ingeniously made to serve the purpose.

The plain letter surrounded with ornament, or placed on an ornamental shield or panel, is another form of initial used. This is, perhaps, the most practical design, owing to the fact that the greatest contrasts may be observed in light and shade—that is, white may be used in contrast to black, as shown in Fig. 46 (a) and (b), (a) showing the simplest example of this style of initial, and (b) the more elaborate form.

Relief and rococo ornament may be used to encircle a letter, which gives an excellent opportunity to bring the letter into prominence by making the center of the panel black and placing a white letter on this, as shown in Fig. 47 (a). A rococo panel is



FIG. 45



FIG. 46

shown in Fig. 47 (b), while Fig. 47 (c) represents a pearl-bordered ellipse, behind which an unfinished panel is suggested. The arrangement of a panel should not be arbitrary, but should conform to the letter that is to be placed on it.

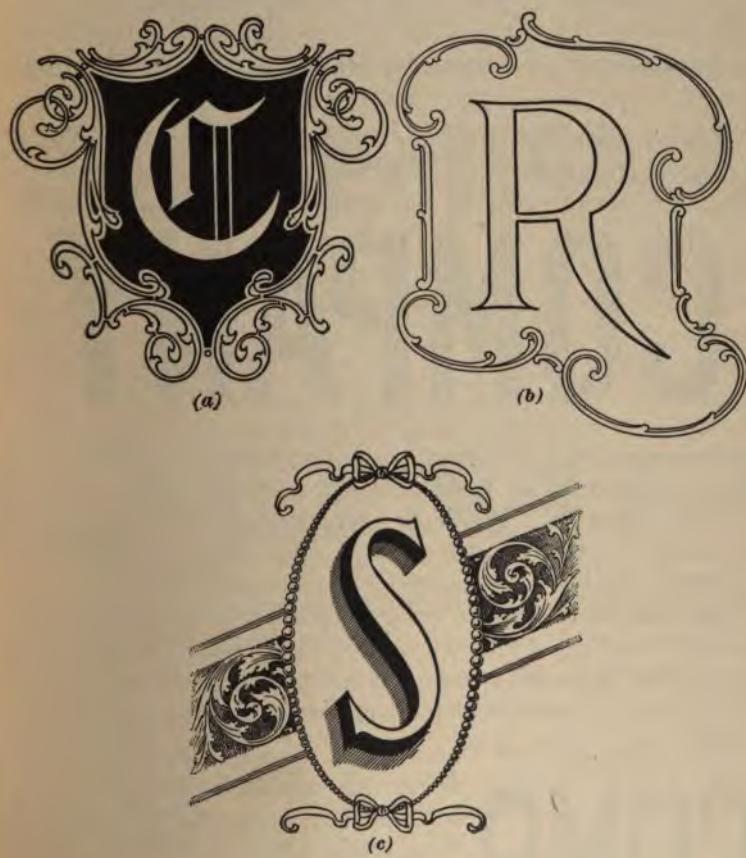


FIG. 47

## EFFECTS IN LETTERING

### CONDENSING, ELONGATING, TELESCOPING, AND INTERLACING

**71. Condensing Letters.**—In conforming letters to a required space, it is often necessary to resort to various means of accomplishing the purpose without making the

# COMPANY

FIG. 48

inscription appear distorted or out of proportion. When the panel or space to be lettered is much shorter than is necessary to admit of a regularly proportioned letter, the **condensing** of the letters must be resorted to, observing generally the rules of their proportionate width. All styles of letters can be condensed except Railroad Block, which was invented exclusively for the opposite purpose. To illustrate more fully, the word company is used to show the two forms of condensing, as well as the two forms of elongating.

**72. Example of Condensed Letter.**—In Fig. 48 is

# COMP

FIG. 49

shown the condensed form, as may be seen by comparing the proportions of the letters with those of the Half Block drawing plate, which are normal. The letterer may condense his letters to the width of those of Fig. 48, and find they are still too

large for the required space; the vertical strokes can then be reduced to one-half the regular width, and the horizontal

strokes maintained at the regular width or even thickened, and less space allowed between letters, as in Fig. 49. This reduces the word to almost one-half that of Fig. 48.

**73. Elongating Letters.**—To elongate the same word in the same style of letter, make the height, for convenience, one-half that in Fig. 48; thus it will be observed that if this elongated letter were twice the height it is in Fig. 50, it would occupy a space almost four times that of



The word "COMP" is written in a bold, sans-serif font. The letters are elongated horizontally, making them appear thinner and longer than in a standard font. The letters are spaced evenly apart.

FIG. 50

Fig. 48. To further elongate this work, reverse the rule illustrated in Fig. 49, by reducing the horizontal strokes to one-half the regular width and keeping the vertical strokes the regular width; or these may be increased to twice their regular width if desired, also giving more space between the letters, as shown in Fig. 51. By this means a word can be



The word "COMP" is written in a bold, sans-serif font. The letters are elongated vertically, making them appear taller than in a standard font. The letters are spaced evenly apart.

FIG. 51

made to fill a space much too long for the regular proportion given this style of letter.

**74. Telescoping** is not of so much practical advantage as condensing or elongating, and is used mostly to produce



The word "COMPANY" is written in a bold, sans-serif font. The letters are written in a way that they overlap each other, creating a sense of depth or "telescoping". The letters are spaced closely together.

FIG. 52

a relief effect. This is done by giving the letters the appearance of overlapping one another, as shown in Fig. 52. Every alternate letter is dropped enough below the line to prevent

confusion of horizontal lines and to preserve the complete identity of each. These letters may be shaded on the background, but not on the face, as this would tend to destroy their legibility.

**75.** **Interlacing** to its fullest extent enters into the construction of a monogram; but the form of interlacing at present under consideration is somewhat different, and includes the interlacing of an entire word. This is very often resorted



FIG. 53

to by the designer, especially in the use of eccentric letters, which are made to extend far beyond the limits of the fundamental styles from which they are derived, as shown in Fig. 53.

#### OUTLINING AND FILLING IN

**76.** **Water Colors.**—Water colors are used for all classes of designing, and especially in commercial advertising work, as a small quantity of lithographic or printed work executed in black outline can be very economically colored or filled in with water colors by hand. A knowledge of the handling of water colors is, therefore, a necessity to the letterer. Water colors used on a white surface are usually the transparent colors—that is, colors that are thinned with

**water** until they contain no body or substance; while the **colors** used on a dark-colored ground must be opaque, in order that the ground may not show through. Some colors, such as orange vermillion, possess an opaque nature; other colors must be made opaque by the addition of white. **Dry color** in powdered form is used when large areas of blended color are required. Such colors as cobalt blue, Turkey red, new green, orange chrome yellow, and lemon yellow are used on white cardboard in show-card writing. They are applied with a wad of cotton, with which the dry color is spread evenly over the surface by gentle rubbing. The outline of the design is the guide for all water-color work in lettering panels, floral designs, etc. The wider this outline is made, the easier will be the work of flowing the color evenly, and the less the liability of running over the line; the fine outline, however, is used in many places, especially for floral designs, etc.

**77. Use of Water Colors.**—Water colors are used to the best advantage on white show-cards that have a dull finish, which readily absorbs the moisture. The outline is made with card black, which is a glossy black; being an oil preparation, the water color will not adhere to it, but flows to the edge and stops. By this outline method, beautiful designs in flowers and highly illuminated effects can be produced. Water colors also serve the purpose of shading or tinting borders of cards outside of the fine line generally surrounding the inscription. For shading the letters, a brush is used that will as nearly as possible make the shade with one stroke, as water color cannot be worked over, when once applied, without showing brush marks. Therefore, the color must be flowed on evenly with a quick, well-directed stroke, care being used not to apply the brush again over a shaded part when the excess water has been absorbed by the card.

## DESIGNING

**78. Scope and Importance.**—The subject of **designing** is an almost inexhaustible one, and covers a broad field. There are, however, many general rules and many commonly accepted forms that establish a foundation on which new ideas may be built. Designing will ever be an art that, aside from these general rules, demands the faculty for producing original conceptions or combinations that must conform to the dictates or system of a recognized class or school. Very few letterers are designers in the full sense of the word, and few of our best designers are good letterers. Students in lettering should cultivate a knowledge of this most important subject. An inscription of several lines of lettering, arranged so as to show intelligence in design, proves that the letterer has accomplished that which is of as much importance as a knowledge of the proper formation of letters. The first thing, therefore, is to study the underlying principles of designing from the curve, which forms the first departure from a plain line of letters to the combination and pictorial designs. The possibilities of original designing lie beyond the limits of this Section. In fact, no teacher can enter with a student on the subject of originality in any art, but the student may be led to the point where he can enter this ground for himself. In showing the many ways in which curved lines are used for inscriptions, no attempt will be made to make lines of letters, but curves and straight lines will be used to represent these.

**79. Some Simple Combinations.**—In Fig. 54 is shown the combination of the plain curves and straight line. The Roman letter or some light-stroke style is used on the curved line, while block or other heavy-stroke letters are used on the straight line. The letters placed on the curve must be either vertical or parallel with the radius of the curve.

Next in importance is the compound curve or ogee, which is used when the inscription is composed of two words of about equal length, as in Fig. 55. Here two ogee curves are used



FIG. 54



FIG. 55



FIG. 56

under a single curve and above a straight line. When one word occurs, use the double ogee, which is made by uniting two ogee curves as shown in Fig. 56. In many designs, the inclined straight lines are used, as shown in Fig. 57 (a), or diminished in width from the outside to the center of the inscription, as shown in Fig. 57 (b).



(a)



FIG. 57

(b)

While these and many other lines and curves are used in designing an inscription, several straight lines of lettering require a great amount of skill in equalizing and arranging them properly, even in straight lines. Often, in such designs, only one style of letter (but of various sizes, as the arrangement may require) is used throughout the inscription.

### RIBBONS

**80.** The **ribbon** is used in many forms, and can be made to suit almost any style of inscription by folding or extend-

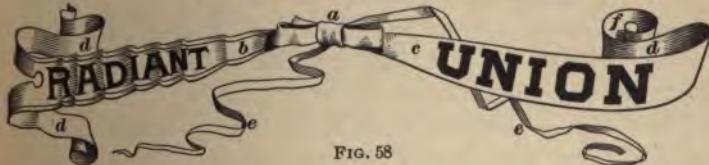


FIG. 58

ing. When folded, the part representing the back of the ribbon is called the *return*, and must be shown by color or shading. The ribbon is made either in a regular curve or

with irregular and broken edges. Fig. 58 shows the ribbon in some of its many forms, of which the names of its component parts are as follows: *a* is the bow; *b*, the broken band; *c*, the regular band; *d*, the returning band; *e*, the streamer; and *f*, the roll.

The ribbon is used also in a square or geometrical form in which case the graceful and natural wave does not enter



FIG. 59

as shown in Fig. 59. This form of ribbon serves a purpose in conventional or set designs.

The ribbon is used also in the same form as the double ogee, and when thus used it must be made symmetrical at both ends. The fold can also be made in the middle of the



FIG. 60

ogee, as shown in Fig. 60, without distorting its symmetrical effect, but rather giving it ease and grace, which should always be the aim of the designer.

**81.** In shading a ribbon, to make it appear natural, always observe the law of light and shade. If the light should strike on one part of the ribbon, the corresponding opposite side must necessarily be in shadow.

The study of light and shade is the first principle of design, and has been considered with reference to individual letters under the head of Shading. In designing, as in drawing from nature, strict adherence to this law is absolutely necessary, as the slightest disregard of it is noticeable to the

skilled eye. We have seen the advantage of shading single letters to the left, and it is well to practice the shading of designs on the left also, in order to avoid mistakes that are otherwise likely to occur, as by showing a shadow on two opposite sides of an object, or of several objects when these are combined to form one single design.

**82. Reflected Light.**—In the shading of ribbons or any rounded object, there occurs what is called the **reflected light**. It shows the edge or line where the darkest parts come together, which, without the observance of this principle, would be lost. Fig. 61 shows this principle of reflected light, the greatest strength of the shade being somewhat removed from the extreme edge of the object, as at *a*, while the shadow cast by the object itself is strongest against the edge at *b*.



FIG. 61

#### PANELS

**83. Rectangular Panels.**—The panel has more forms than the ribbon and is made to serve many purposes. The simplest form is that of a rectangle, within which is sometimes drawn an inner panel of the shape shown in Fig. 62.



FIG. 62

The surroundings of the panel can be made either simple or elaborate, as the material at hand in this style of design is inexhaustible. One of the many forms of the exterior of the

panel is such as shown in Fig. 63. This work may be so elaborated that the inner panel on which the lettering is to be placed becomes of minor importance, as shown in Fig. 64.



FIG. 63

This, of course, is not such a design as should be used to display a conspicuous inscription. The fact must be kept in mind that the inscription, if important, is of greater value



FIG. 64

than the ornamentation, that the latter is employed only as a setting for it, and must not be allowed to detract from its prominence.

**84. Part Panels.**—Another form of panel is that which is combined with some other design, in which the panel is not

in the foreground of the design, as shown in Fig. 65. When the panel is left unfinished at one end, as in Fig. 65, it is



FIG. 65

known as a part panel, and many beautiful effects may be secured by its aid. In this, the damask principle is used, the panel being blended into the ground by means of color or with the pen. The lettering also is blended; the extreme of light color is thus contrasted against the darkest part of the panel, and the dark lettering is continued on the light ground outside the panel.

**85.** Elliptic and round panels are also used and may



FIG. 66

be made extremely ornamental. A touch of simple ornament in a design will often counterbalance a quantity of plain work and give a general effect of ornamentation throughout.

Fig. 66 shows an elliptic design, with merely a frame of ornamentation, which is sufficient for the purpose of ornamenting a design. When such work is placed on other plainer material in a design, it gives the whole the appearance of completeness.

**86. Rococo Panels.**—Another style of panel that has come into modern designs is the **rococo panel**; not only is the scrollwork used for the panel itself, but it is frequently applied to the embellishment of many parts of the design.



FIG. 67

Fig. 67 shows one of the great variety of shapes the rococo panel assumes, as this style can be made to conform to the lines of any inscription, or to form a part of nearly any style of design.

The same style of scroll is frequently used for the purpose of filling up an open space in a design, although this is done also through the employment of natural forms, such as palms, olive or laurel branches, flowers, leaves, and conventional objects, vases, lamps, lions, griffins, etc., and, in fact, any object pertaining to or in harmony with the inscription. If the inscription of a design pertains to music, the lyre may be used to embellish the design; if it pertains to a trade, such tools as are identified with the trade may appear in the design. If literature or science is the subject, symbolic

objects may be used in a variety of ways. A large collection of choice designs should always be on hand for reference, in looking over which a suggestion may often be obtained that leads the designer's thoughts into an original channel, originality being, as stated before, the chief aim of the designer.

#### INSCRIPTION DESIGNING

87. **Proportion.**—A piece of lettered work, no matter how artistic or elaborate it may be in itself, is not satisfactory if improperly proportioned or balanced. The tend-

**LAKE VIEW  
PERMANENT  
SAVINGS  
~AND~  
LOAN  
ASSOCIATION  
OF CHICAGO.**

FIG. 68

ency in designing is to distribute the strength over the entire surface. The law of art that governs a picture is applicable to designing. The *foreground* should be the strength of a picture, the *middle distance* should be the semi-strength, while the *distance* should be indistinct. This is the

key not only to successful designing, but also to satisfactory lettering. The top and bottom lines of the design shown in Fig. 68 are Roman; the words "permanent" and "association" are of heavier face, while the strength of the inscription is centered in the two middle lines. The selection of the proper style of letter to suit each requirement should be carefully studied. A single word or line of letters can be made of any form or style, but as soon as another line is added the letterer is compelled to study their combinations, and to make their relation to each other harmonious to the eye and in proper proportion. In an inscription of several words, the most important should be displayed in the most prominent style of lettering, such as the Block or Egyptian,



FIG. 69

while the less important should be of smaller letters, and of such one-stroke styles as the Roman. This rule does not interfere with the general effect produced in Fig. 68. If it should happen that the inscription cannot be made to conform to one rule in designing, it is best to change the design accordingly. In Fig. 69 is shown an inscription of ten words in which the first and last words are the most important, and from which eight words, therefore, could be taken without destroying the principal feature of the whole inscription—the name of the manufacturer and the product manufactured by him. These words, therefore, should be given the greatest prominence by making them of large, solid-stroke letters.

**88. Contrast Designs.**—There is no stronger contrast in lettering than that between black and white. If a design

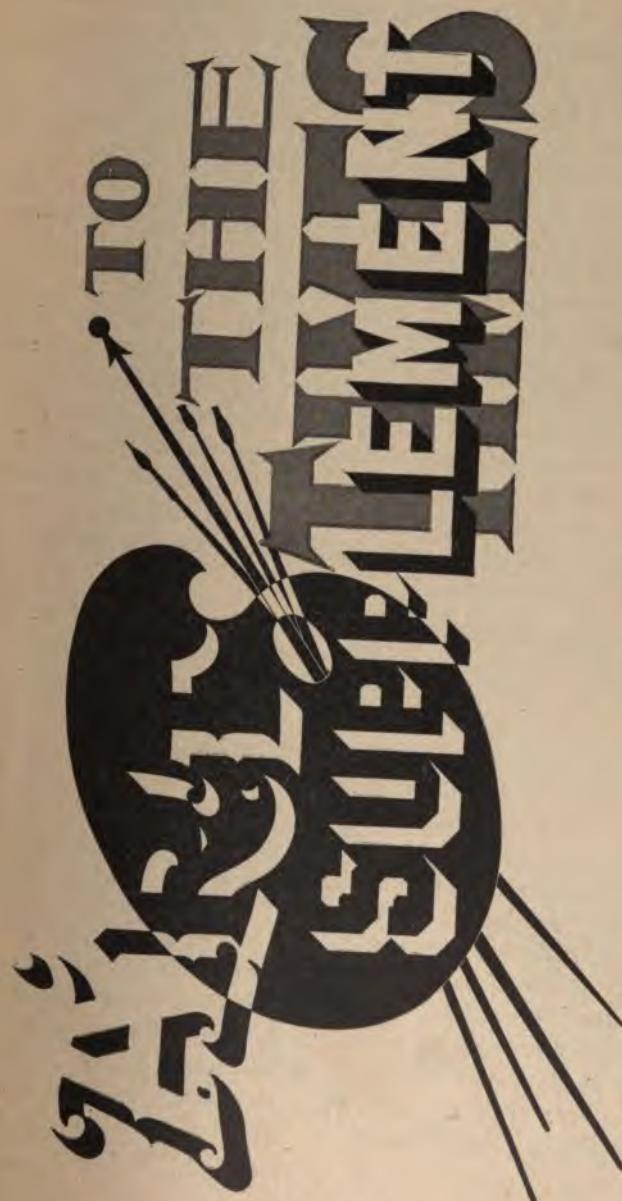


FIG. 71

possessing, at the same time, cleanliness and finish when the work is completed. The stencil pattern most effectually answers the purpose; it can be used to stencil either the letter or the background. The stencil for the former purpose is made by cutting out of paper or other material the greater portion of the letter, but allowing parts called *ties* to remain, as these tie the inside of the letter and parts likely to curl up when in use. A second stencil is also required, which is laid over the work done by the first stencil when it has dried, thereby filling up the spaces left by the ties, and thus making a solid and complete letter. The same rule is observed in regard to the *cutting-in* stencils, which are used to make the background, the parts of the surface untouched by the background color constituting the letters, and also the border. Large ties are used for cutting-in stencils, reaching from the letter to the edge of the stencil or border. A second stencil, so cut as to overlap the edges of the ties, is also used, thereby completing the entire background, leaving the letter clear and distinct.

**91. Variegated Grounds for Stenciled Letters.** The ground having been prepared and the inscription designed, the spaces occupied by each line of letters can be blended—a process known among letterers as **variegated stenciling**. This is accomplished by laying various tints on a ground and blending them together. As colors are too strong for this purpose, two or three delicate tints are used, and are laid on horizontally, and without regard to where the color is placed, except where the letters show. In all cases, the selection of the tints used to variegate the letters should be governed by the color to be used for the background, according to the rules of harmony and contrast. If the ground be stenciled in black, such tints as yellow, blue, green, or pink may be used. It is necessary to give the portion of the letter that is to remain white a coat of fresh white in order that the tints may be blended into the white without showing brush marks.

## MATERIAL FOR STENCILS

**92. Paper.**—The toughest medium-weight Manila paper should be used for stencils, oiled thoroughly with boiled linseed oil, and allowed to stand at least 24 hours before being thinly coated on both sides with orange shellac. If a light quality of fiber board is used, no preparation is necessary. A sheet of glass laid on a perfectly even table provides a surface on which the stencil can be cut with a good steel knife sharpened to a point. It is well to mark the ties with some bright color to avoid cutting through them, as a single tie cut through destroys the whole stencil, and an imperfect stencil will cause more trouble in its use than it is worth. It is best, therefore, never to use a patched or repaired stencil.

**93. Tin-foil stencils** for glass sign printing are designed and cut in the same way as the paper. A roller only is used in operating this stencil, while either brush or roller may be used with the paper stencil. A large soft brush will produce better results than a stiff brush, and be less likely to destroy the pattern. In dipping the brush in color, great care should be used to rub it out well, so that but little remains before applying to the stencil. This is the secret of cleanliness in stenciling.

**94. Cutting Stencils.**—Fig. 72 (a) and (b) shows one

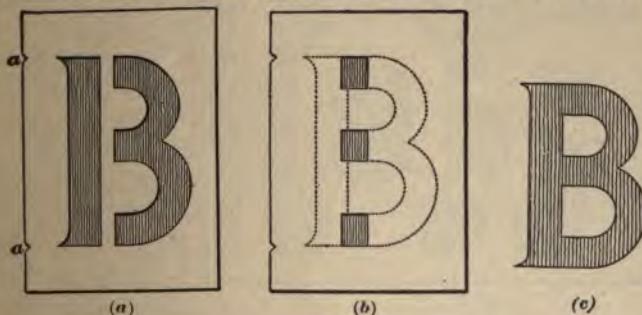


FIG. 72

method of cutting stencils. View (a) shows the stencil that makes the letter, allowing ties to remain where most strength

is needed for the preservation of the stencil. This stencil being completed, a small triangle *a* called the *register*, or *guide*, is cut in each corner, by which the stencil can always be placed in its proper position. This stencil is placed on the material prepared for the No. 2 stencil, as shown in Fig. 72 (b). Letters are either marked or stenciled with a brush, which should be almost free from color, so that the second stencil for the ties can be cut out, allowing enough lap to fully insure its covering the open space, as shown in Fig. 72 (c). The finished letter is shown in Fig. 72 (d). Register, or guide, marks are cut in the second stencil also, though these marks are never used except where a border color is to be placed afterwards; they serve only to accurately place a second stencil in position. The edge or corner of a sign, or the corner of the letter will, in most cases, serve as a guide in stenciling. Ties should always be cut so as to do away with points or projections, as well as to secure strength where needed. If these rules are not followed, serious difficulty will be experienced when using a stencil, and may necessitate the making of a new stencil before the first one has been made to fully serve its purpose.

**95. Background Stencils.**—To make stencils for background patterns, draw the design on a sheet of paper, and then cut it out with a sharp knife.

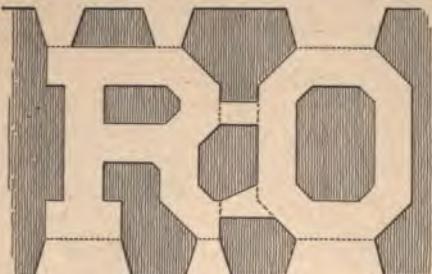


FIG. 73

thereby they give more strength where needed. In making this stencil, it is better to have too many ties than to leave one place weak. The general tendency is to leave one

more such places in this form of stencil. Fig. 73 shows two letters R, O, and the ties necessary for strength and protection. Fig. 74 shows the No. 2 stencil, or the one to be used to cover spaces left by the ties of No. 1; the parts to be cut out are represented by the shaded spaces. Fig. 75 shows the completed letters and the background, when stenciling has been done with both stencils.

**96. Sign Stenciling.**—Stenciled signs are often relieved by a few touches of hand work, either in outlining the letters or by artistically using some bright coloring that produces the effect of study and labor. This is often accomplished by shading or ornamentation. For stencil work, a color must be used of a slow-drying nature, otherwise the stencil will soon become clogged and more liable to become broken. There is also danger of using color too thin, the result being that it flows underneath the edge of the stencil, thereby destroying the cleanliness of the work.

**97. Cleaning Stencils.**—The stencil must be cleaned often when in use. Not more than five or six signs should be stenciled before cleaning the stencil, which may be done by laying it face down on a clean board or other surface and rubbing it well on the back with a cloth rolled into a ball.

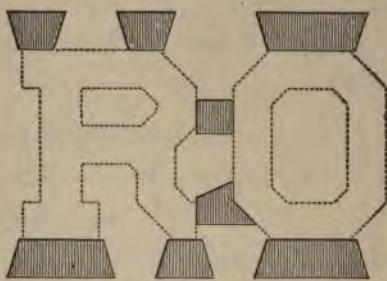


FIG. 74

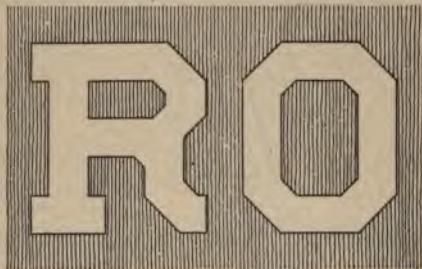


FIG. 75

The stencil must be thoroughly cleaned with benzine after using, and never put away with any color remaining on it. This, if neglected, will either cause the stencil to break easily, or the thickness of the dried color will permit fresh color to flow underneath. Color left to dry on stencil often so warps it as to render it practically useless, or cause the letterer much unnecessary trouble.

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### GEOMETRICAL FIGURES

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#### TRIANGLES

98. A triangle is a closed figure having three angles and three straight sides.

99. An isosceles triangle has two equal sides and two equal angles. Fig. 76. The length of the third side is different from that of the two equal sides, and is usually called the base. The term base, however, is applied without distinction to any side on which a triangle is supposed to stand. The base may therefore be horizontal, vertical, or inclined, as shown at *b* in Fig. 77.



FIG. 76

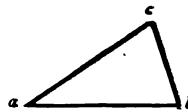


FIG. 77

100. Altitude.—Whatever side is taken as the base of a triangle, the altitude or height of the triangle is the perpendicular distance from the base to the vertex of the opposite angle. That vertex is also called the apex of the triangle.

101. Angular Pediment.—When the height of an isosceles triangle is short in comparison with the base, the triangle is called an angular pediment, Fig. 78.

**102.** A **gable** is an isosceles triangle whose equal sides differ but little from the third side (see Fig. 78). Gables, however, may also have the shape of Fig. 79.

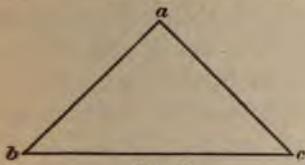


FIG. 78

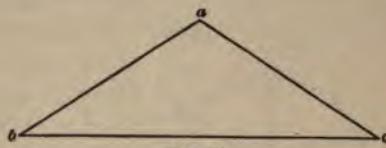


FIG. 79

**103.** An **equilateral triangle** has three equal sides and three equal angles, as shown in Fig. 80, which is made up of two equilateral triangles.

**104.** A **right triangle** is one in which one of the angles

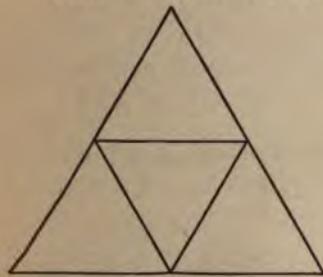


FIG. 80

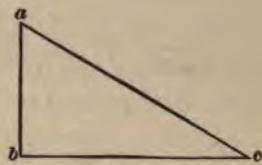


FIG. 81

is a right angle, Fig. 81. The side opposite the right angle is the longest, and is called the **hypotenuse**.

A triangle cannot have more than one right angle, nor more than one obtuse angle; that is, if one of the angles is either right or obtuse, the other must be acute.

#### CIRCLES

**105.** A **circle** is a closed figure, all the points of whose outline are at the same distance from a point within called the **center**, Fig. 82. The term circle is applied both to the curved outline of the figure and to the space enclosed by it; but the curved outline is more commonly called the **circumference** of the circle.



FIG. 82

**106. Radius and Diameter.**—The distance from the center of a circle to any point on the circumference is called the **radius** of the circle. The length of a line drawn through the center of a circle and having its ends on the circumference is called the **diameter**. In Fig. 83, *O* is the center of the circle, the distance from *O* to *B*, *D*, or *A*, or to any other point on the circumference, is the radius, and from *A* to *B* or from *C* to *D* is the diameter.

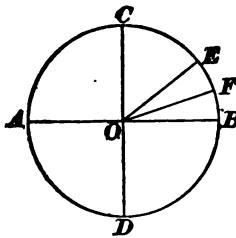


FIG. 83

The diameter of a circle is twice its radius, and divides the circle into two equal parts, or **semicircles**, and the circumference into two **semi-circumferences**.

Two diameters, perpendicular to each other, as *AB* and *CD*, divide the circumference into four equal parts called **quadrants**.

**107. A curve** is a line no part of which is straight; it may be imagined to be formed by the bending of a straight line. Any portion of a curve is called an **arc**.

**108. An arc** is any part of a circumference. Arcs having the same center but different radii are called **parallel arcs**. They are also called **concentric**, that is, they have the same center.

#### ORNAMENTAL CURVES

**109. An ogee** is a line curved in two directions, and having approximately the form of the letter S; in Figs. 84 and 85 it is shown in two positions. Two ogives may be



FIG. 84



FIG. 85

joined as in Fig. 86 to form what is called a **swell line**, or **double ogee**.

**110. A scroll**, applied as an ornamental line, is a continuous line drawn spiral shape. When drawn from

a center point, it gradually increases the space between the revolutions of the line shown in Fig. 87.



FIG. 87

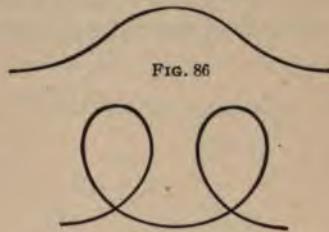


FIG. 86

FIG. 88

**111.** A **loop**, Fig. 88, consists of two curves similar to the corresponding parts of right and left scrolls, connected as shown.

#### THE ELLIPSE

**112. A Simple Method of Describing an Ellipse.** There are many ways of making or describing an ellipse, some of which are quite complicated. For designing purposes, exclusive of architectural work, a knowledge of two or three methods will serve every purpose, and fill the needs of the average letterer and designer. The simplest method is by means of two tacks and a string; or, if needed for landscape gardening or other large-proportioned work, use hemp cord and nails or pegs. Draw a horizontal line, and intersect equally with a vertical line; point off on the horizontal line the length of ellipse desired; divide the horizontal line, from this point to the vertical line, into four equal parts, and place the tack on the third point from the vertical on either side; place the other tack also in a corresponding position opposite; place a string around both tacks, and tie the ends together at the point farthest from the

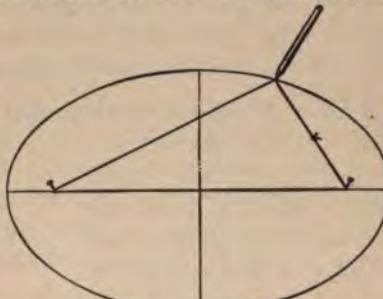


FIG. 89

vertical on the horizontal line; place a lead pencil inside and follow around, and a perfect ellipse will be the result, as shown in Fig. 89. By moving the tacks farther away from the vertical line, the ellipse is elongated, if the same string be used.

**113. Mechanical Method.**—To draw the ellipse shown in Fig. 90, construct two squares and draw lines from the corners intersecting in the center of each square; from this point of intersection, describe the arcs, with compass from  $a$  to  $b$ ; from the points  $c$ , describe upper and lower lines from  $a$  to  $a$  and  $b$  to  $b$ .

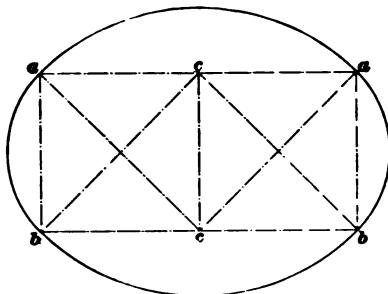


FIG. 90

To draw parallel ellipses, measure off the reduction required on the oblique lines from points  $a$  and  $b$ , then describe the arcs from the point of intersection of oblique lines and from  $c, e$ , running lines through points that give the smaller ellipse.

**114. Another Mechanical Method.**—Another simple form of the ellipse is made by describing two circles, which together form the length of the ellipse, and drawing a horizontal line through the centers of both circles, as in Fig. 91; each semicircle is then divided into three equal parts, as at  $a, a, a, a$ , and a line is drawn from each through the centers of both circles meeting at the points  $b, b$ ; from these points describe the curves from  $a$  to  $a$ , top and bottom, and the resulting figure will be an approximate

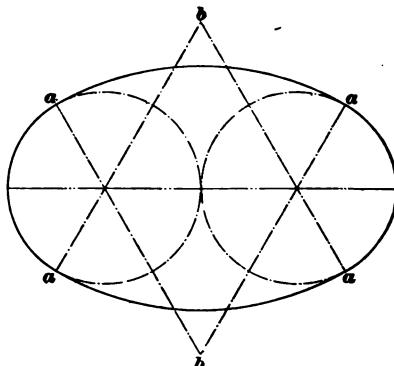


FIG. 91

ellipse. The ellipse is sometimes spoken of as an *oval*. This word, however, is a misnomer, as the oval derives its name from the Latin *ovum*, meaning "an egg," and its shape is the outline of an egg. Never refer to the oval therefore as an egg-shaped oval, for the statement would be equivalent to referring to a circle as a round circle.

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### MODIFICATIONS

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#### ECCENTRIC FORMS OF LETTERS

**115. Extent of Modification.**—The various styles of alphabets taught in this Course are known as *fundamental* styles. From these principal styles, other forms have arisen that closely resemble their prototypes in general character, but have been given some extreme treatment in outline or detail that brings them within the classification of *eccentric alphabets* or *letters*. It is not necessary that a letterer should be familiar with all modifications of letters, as these exceed 800 in number, and may be seen to the best advantage in a typefounder's specimen book. There are, however, a number of modifications that are almost as generally used as the normal letters, and these must be brought prominently before the attention of the student. To be a versatile designer, it is necessary that a student should memorize the underlying principle that governs the formation of each modification and be able to apply this to corresponding letters throughout each alphabet.

**116. Latin, or Roman, Alphabets.**—The characteristic feature of the original **Latin, or Roman, alphabet** was its irregularity, which is plainly shown on the Arch of Titus, Fig. 1. No space is allowed between the words, the separation being implied by a dot on a line with the center of the letter. The tail of the R and the Q often projects the full width of the letter. The letter V was also employed to express the sound of U, but its modern use in that capacity by some designers is erroneous. The other sound of this

character in Latin resembles that of the English W, having somewhat the sound of the V instead of the U. Hence, the origin of the W, which is not derived from U but from V, and originally written VV, expressed by two separate characters. In the letter A, many designers add a horizontal

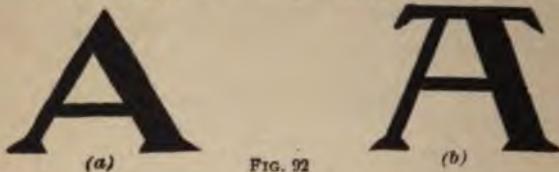


FIG. 92

stroke which gives it the effect of antiquity, though, in fact, it is a modern modification. Fig. 92 (a) shows the normal letter and (b) the modification.

**117. Post Old Style.**—A form of letter quite popular with designers is that known as **Post Old Style**. The formation of these letters follows somewhat the general outline of Roman, and in character they partake of French



FIG. 93

Roman. They appear to the best advantage in a condensed form. Fig. 93 (a) shows several letters of this style.

When making this style of letter, avoid sharp angles by rounding vertical lines into horizontal. The light stroke should be about one-half that of the heavy stroke.

Fig. 93 (b) shows several letters of the style known as **Cheltenham Old Style**. This letter follows more closely the Full Block, having narrow horizontal strokes and short spurs that classify it as a distinct style.

#### 118. Serrated-Edge Letter.

—As a novelty in letter formation, the broken or **serrated-edge letter** is used. This may be made quite artistic and legible if the general effect is uniform and the letters are formed so



FIG. 94

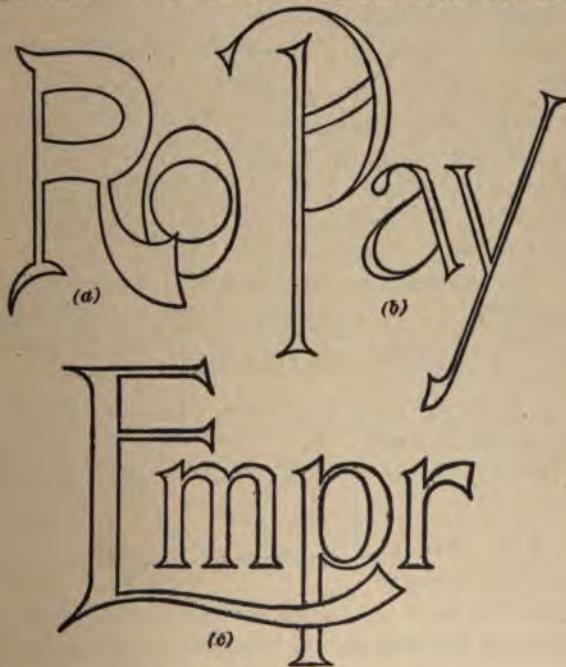


FIG. 95

as to follow some particular style of alphabet. The letters shown in Fig. 94 are after the style known as French Roman.

A cast shadow, such as is shown in the example given, may be used in connection with this treatment of the outline,

in which case it should follow, in a general way, the outline of the letter.

**119. Condensed Letters.**—Modifications exist in many alphabets because of special requirements in designing. For example, the extremities of letters that are placed in close proximity to one another call for some alteration in the normal letter that will satisfy immediate requirements. In making condensed letters, this liberty is more apparent than in extended letters. In Fig. 95 are given several examples of various modifications.

One extreme, wherein the vertical stroke is reduced and the horizontal stroke widened, is shown in Fig. 95 (a); (b) shows to what extent projections may be carried without impairing



FIG. 95

a legible and symmetrical appearance; Fig. 95 (c) shows how a stroke of a letter may be carried underneath several letters in order that additional space may be gained in spacing the letters.

**120. The character &.**—called also ampersand, is subject to modification to a greater degree than many of the letters of the alphabet. In Fig. 96 (a) and (b) are shown modifications of the Antique Egyptian (heavy) and the French Roman (heavy) forms, respectively.

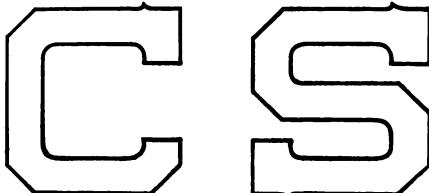


FIG. 96

**121. Full Block.**

There does not seem to be much opportunity to change or modify the letters of the Full Block, and yet the sign painter has introduced modifications that are of a practical nature, especially when cutting in these letters. It will be seen that in Fig. 97 the inside bevels are omitted and the outlines of the horizontal and vertical strokes are united with curved lines instead of bevel lines, also that a small projection is shown in the top and



FIG. 97

bottom lines of letters that otherwise would be plain. This is done to give the stroke the appearance of extending through the letter in a vertical direction.

**122. Pen-stroke letters** are subject to modifications in so far as these give to the letterer the advantage of greater speed. Especially is this a consideration with the sign painter and show-card writer. In the word

used to illustrate this treatment, the stroke of the small straight-stroke letters is given a slight curve at the top and bottom, while the small letters with curved strokes, such as o and d, are completed with two strokes of the pen. As many letterers are now using auto, fountain, and Soennecken mechanical pens for executing many styles of letters, this modification is found of great practical value.

**123. 16th Century.**—There are several forms of letters that bear the title **16th century**, all of which are but modi-



FIG. 98

fications of Roman or Gothic, and more often are a combination of both. The ends of all vertical strokes of such letters are finished either with an ornamental trefoil or fleur-de-lis. This is so arranged in outline that the horizontal strokes of such letters as B, F, etc. may be joined on to the end of the stroke and give the letter an artistic uniformity and

symmetrical finish. In Fig. 98 are shown several forms of this style of treatment.

It is an easy matter to construct an alphabet of the 16th century style after one has become familiar with the Roman and Gothic alphabets. The letters generally follow the Roman, but in all crescent-stroke letters, such as C, G, and O, the outlines follow those of the Gothic.

**124. Close-Spacing.**—In modern designing, there is a method of attaching letters to each other that, if not carried to an extreme, gives a word an artistic appearance and allows the letterer to space the inscription to much better advantage than when using detached or separated letters. The styles of letters best adapted to this form of treatment are Antique Half Block, Roman, French Roman, Antique Egyptian, etc. The spurs of these letters are joined together, leaving the main strokes separated, which renders the letters distinct in outline and character and gives the word sufficient legibility.

In Fig. 99 (a) are shown examples of this form of treat-



FIG. 99 (a)

ment, which is a modification of the general rule governing the spacing and arrangement of letters in a word.

The engrosser uses a form of close-spaced letter in which the stroke of the letter is exaggerated to almost the fullest extent. In this treatment, no space whatever is left between letters. They are shaded with a heavy double shade, giving

a solid-block appearance. The Antique Half Block is generally used for this class of work, and such modifications made in their outline as will suit the special requirements. These



FIG. 99 (b)

occur mostly in the position of the stroke of the letter as shown in Fig. 99 (b).

**125. Antique Egyptian.**—There are several forms of each letter of the Antique Egyptian alphabet, which if seen by the student in connection with the regular or normal letter would tend to confuse him, or at least cause him to inquire why he should observe any system or regularity of form. The law of uniformity is, in lettering, what the order is in



FIG. 100

architecture; each must be closely followed, or to the skilled eye the work is subject to criticism. These styles, therefore, must not be confused. If one form is adopted, it must be strictly adhered to throughout the lettering of the design. This may be more clearly shown by two or three of these forms of the capital letters and their corresponding lower case. When the slanting stroke is used in

such letters as H, M, N, and V, it also occurs in many of the small letters, as a, d, h, m, n, and u, as the letters M and n, in Fig. 100, will show. The letter o is sometimes used in this style, as here shown, and the letter t is often crossed above the line.

Another form of the Antique Egyptian style is shown in the curved stroke, in place of the horizontal middle stroke, of many capital and small letters, as in the E and t in Fig. 101; while a change in the spur of the horizontal strokes changes the character of the entire letter, as shown in the letters L and T, Fig. 102. There are many other

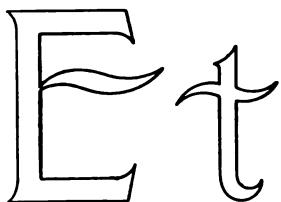


FIG. 101

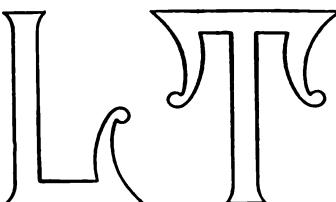


FIG. 102

slight departures from the normal style, one of which occurs in the middle bar of the A and H, as shown in Fig. 103.

There is still another form of letter, belonging to the

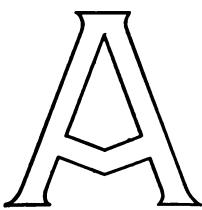


FIG. 103

Plain Egyptian style. This form is simple in its construction, and is not sufficiently distinctive to be classified with the fundamental styles; but in one respect this form of letter is closely allied to the French Roman, the similarity consisting in its having the heavy and light line, as shown in Fig. 104.

A few letters of this style are therefore shown to give the student an idea of the comparative widths of the stroke and fine line. The latter should not exceed one-third the width of the stroke. There is almost unlimited license granted in forming these letters, as shown in the two letters E and T. In making these letters never place a spur on any part of the letter, as this at once destroys the characteristic feature of the style in favor of the French Roman; and to widen the

fine line to nearly that of the stroke brings it within the classification limits of the Egyptian. Never show a suggestion of a straight line on the inside of the round letters, but always make a perfect ellipse or a symmetrical curve. This



FIG. 104

letter holds an important place with modern designers, but a knowledge of the Egyptian and French Roman only is necessary to produce this modification. This is likewise true of all letters used. By a thorough knowledge of the few fundamental styles, the student can readily trace all variations arising from these to their parent style.

126. The **Boston Roman** has a slight variation from the normal form shown in Plate 14, which occurs in the spur only, but which gives it a marked difference in appearance from the regular style. The spur, instead of being finished on the end, as shown in the drawing plate title, Boston Roman, is cut off at an angle of about  $45^{\circ}$ , as shown in Fig. 105.



FIG. 105

127. **Antique Half Block.**—The alphabet known as **Antique Half Block** has two or three varieties. Such of the capitals, as well as the small letters, as possess a



FIG. 106

FIG. 107

middle stroke have this stroke changed to an angle of  $60^{\circ}$ . In one variety, the short strokes of the small letters are

cut at the same angle as the middle stroke, as shown in Fig. 106, the angle of the s being directly opposite. Another variety of this letter resembles that shown in Fig. 106, except that the short strokes are altered in appearance and are finished with a fine line and a dot, as shown in Fig. 107. This form of letter can be spaced more closely than the



FIG. 108

regular style used in condensed spaces, and the variety shown in Fig. 108 requires even less space than either of the others; and as the corners are not cut off, the letter possesses a square, compact appearance, somewhat relieved of severity by the finishing of the corners with a slight spur. The same rule of formation applies to capitals as well as to small letters, except that the middle bars of E and F are always horizontal.



FIG. 109

128. The French Roman is also slightly changed, giving rise to several varieties, as shown in Fig. 109. In the letter E, Fig. 109 (a), the only difference from the Ancient Roman style is the spur that projects at a right angle from the horizontal lines top and bottom. In the letter shown in Fig. 109 (b) the spurs are the same as in Fig. 109 (a), except

those of the main upright strokes, which are finished with a flat end. The round letter of this style is shown in Fig. 109 (c).

**129.** The **Flemish**, or **Dutch**, so closely resembling the German Text, is another style that will not be considered in this Course. The characteristic feature of this alphabet is the diamond, dot, and plain vertical stroke and fine line, as shown in Fig. 110, its other features being practically the same as those of the German style. In the small letters very little change occurs, except that a ball is added to many of the long-stroke letters, as shown in the figure.



FIG. 110

**130. Variations.**—There are so many variations in letters arising from some simple idea, that any student of



FIG. 111

lettering may apply one or more of them to a fundamental style; and such ideas are so numerous, that it will be



FIG. 112

impossible to call attention to more than one or two of these in conclusion.

The curved stroke is one such style, and is shown by the letters D, R, U, G, in Fig. 111. Another of these styles is

produced by curving the spurs and horizontal strokes of the block letters, especially the full block, as shown in Fig. 112.

**NOTE.**—The modifications considered in the foregoing pages of this Section refer to fundamental styles, many of which the student will not have occasion to refer to, or make comparisons with until well advanced in his Course. It is advisable, therefore, that a study of these variations be deferred until the plates mentioned in this connection have been received, and the fundamental styles have become familiar to the student.

### MECHANICAL LETTERING

#### TOOLS AND INSTRUMENTS

**131.** When instruments such as the T square, triangles, compasses, etc. are used to execute lettering, it is called *mechanical lettering*, as distinguished from *freehand lettering*, which is executed with the pen or brush, unaided by anything except the judgment of the eye.

**132. Drawing Boards.**—All the instruments and materials required for this Course are mentioned in the fol-

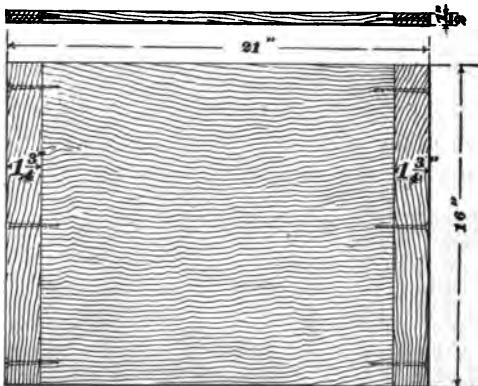


FIG. 113

lowing descriptions: The drawing board should be made of well-seasoned straight-grained pine, the grain running lengthwise. For this Course the student will need a board of about the following dimensions: length, 21 inches; width,

16 inches; the thickness may be made about  $\frac{1}{2}$  inch. There should be two end-pieces  $1\frac{1}{4}$  inches wide, as shown in Fig. 113, which are fastened to the board by nails or screws. Both of these pieces should be perfectly straight.

A better board is shown in Fig. 114; here the end-pieces

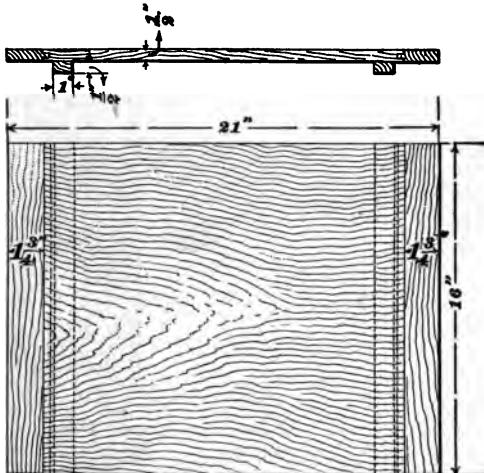


FIG. 114

are fastened to the board by a glued matched joint in addition to nails or screws, and there are two cleats on the back

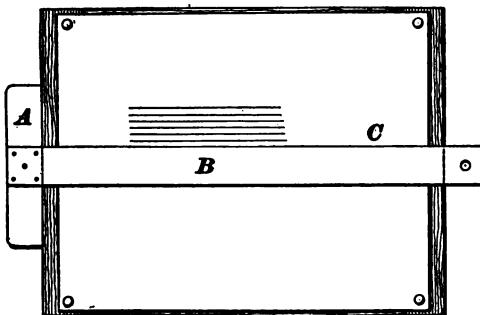


FIG. 115

of the board 1 inch thick by  $\frac{1}{2}$  inch wide, extending the whole width of the board. The cleats raise the board from the table and make it easier to change its position.

133. The **T** square is used for drawing horizontal straight lines. The head *A* is placed against the left-hand edge of the board, as shown in Fig. 115. The upper edge *C* of the blade *B* is brought very near to the point through

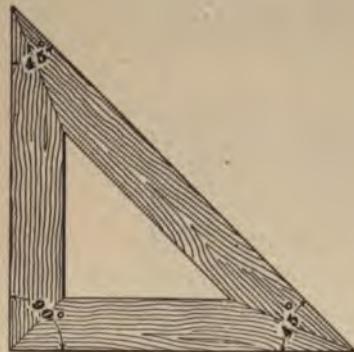


FIG. 116

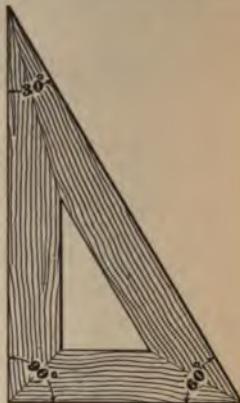


FIG. 117

which it is desired to pass the line, so that the edge may be used as a guide for the pen or pencil. It is evident that all lines drawn in this manner will be parallel.

Vertical lines are drawn by means of triangles. The triangles most generally used are shown in Figs. 116 and 117.

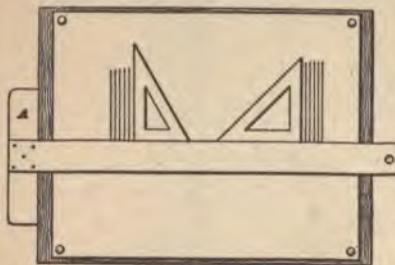


FIG. 118

Each has one right angle, marked  $90^\circ$  in the figures. Fig. 116 has two angles of  $45^\circ$  each, and Fig. 117 one of  $60^\circ$  and one of  $30^\circ$ . They are called  $45^\circ$  and  $60^\circ$  triangles, respectively.

To draw a vertical line, place the **T** square in position to draw a horizontal

line, and lay the triangle against it, so as to form a right angle. Hold both **T** square and triangle lightly with the left hand, so as to keep them from slipping, and draw the line with the pen or pencil held in the right hand and against

the **edge** of the triangle. Fig. 118 shows the triangles and **I** square in position.

**134. Drawing Parallel Lines.**—For drawing parallel lines that are neither vertical nor horizontal, the simplest and **best** way, when the lines are near together, is to place one **edge** of a triangle, as *ab*, Fig. 119, on the given line *cd*,

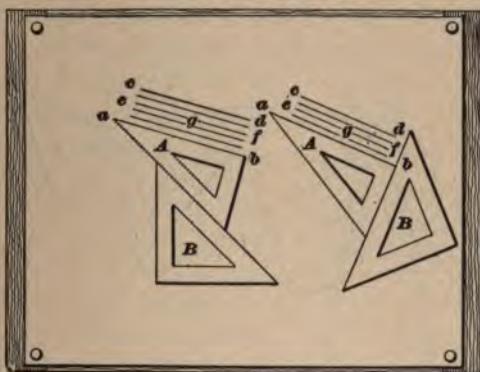


FIG. 119

and lay the other triangle, as *B*, against one of the two edges, holding it fast with the left hand; then move the triangle *A* along the edge of *B*. The edge *ab* will be parallel to the line *cd*; and when the edge *ab* reaches the point *g*, through which it is desired to draw the parallel line, hold both triangles stationary with the left hand, and draw the line *ef* by passing the pencil along the edge *ab*. Should the triangle *A* extend too far beyond the edge of the triangle *B* after a number of lines have been drawn, hold *A* stationary with the left hand and shift *B* along the edge of *A* with the right hand, and then proceed as before.

**135. Drawing Oblique Lines.**—A line may be drawn at right angles to another line which is neither vertical nor horizontal, as illustrated in Fig. 120. Let *cd* be the given line (shown at the left-hand side). Place one of the shorter edges, as *ab*, of the triangle *B* so that it will coincide with the line *cd*; then, keeping the triangle in this position, place

the triangle *A* so that its long edge will come against the long edge of *B*. Now, holding *A* securely in place with the left hand, slide *B* along the edge of *A* with the right hand, when the lines *hi*, *mn*, etc. may be drawn perpendicular to *cd* along the edge *b* *f* of the triangle *B*. The dotted lines

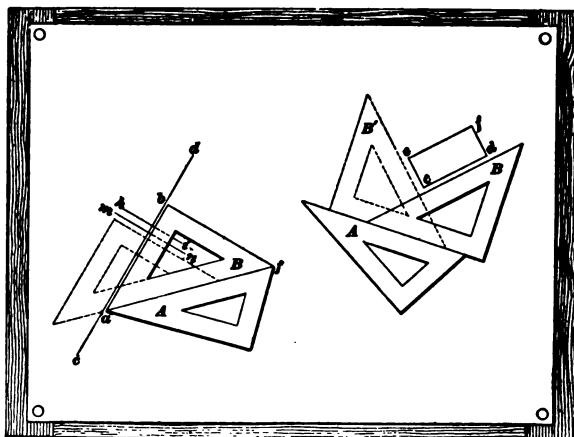


FIG. 120

show the position of the triangle *B* when moved along the edge of *A*.

**136.** The right-hand portion of Fig. 120 shows another method of accomplishing the same result, and illustrates how the triangles may be used for drawing a rectangular figure when the sides of the figure make an angle with the T square such that the latter cannot be used.

Let the side *cd* of the figure be given. Place the long side of the triangle *B* so as to coincide with the line *cd*, and bring the triangle *A* into position against the lower side of *B*, as shown. Now, holding the triangle *A* in place with the left hand, turn *B* so that its other short edge will rest against the long edge *A*, as shown in the dotted position at *B'*. The parallel lines *ce* and *df* may now be drawn through the points *c* and *d* by sliding the triangle *B* on the triangle *A*, as described in Fig. 119. Measure off the required width of the figure on the line *ce*, reverse the triangle *B* again to its

original position, still holding the triangle *A* in a fixed position with the left hand, and slide *B* on *A* until the long edge of *B* passes through *e*. Draw the line *ef* through the point *e*, and *ef* will be parallel to *cd*. You should practice with the triangles before beginning drawing.

**137.** The compasses, next to the T square and triangles, are used more than any other instrument. A pencil and a pen point are provided, as shown in Fig. 121, either of which may be inserted into a socket in one leg of the instrument for the drawing of circles in pencil or ink. The other leg is fitted with a needle point, which acts as the center about which the circle is drawn. In all good instruments, the needle point itself is a separate piece of round steel wire, held in place in a socket provided at the end of the leg. The wire should have a square shoulder at its lower end, below which a fine, needle-like point projects. The *lengthening bar*, also shown in the figure, is used to extend the leg carrying the pen and the pencil points when a circle of large radius is to be drawn.

The joint at the top of the compasses should hold the legs firmly in any position, and at the same time should permit of their being opened or closed with one hand. The joint may be tightened or loosened by means of a small implement provided for the purpose and which accompanies the compasses.

It will be noticed in Fig. 121 that each leg of the compasses is jointed; this is done so that the compass points may always

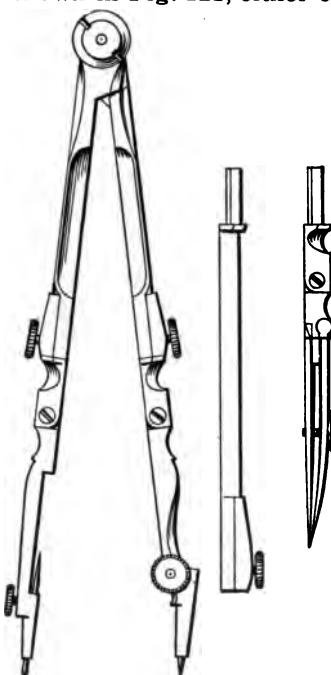


FIG. 121

be kept perpendicular to the paper when drawing circles, as in Fig. 123.

**138. Drawing Circles.**—The following suggestions for handling the compasses should be carefully observed by those who are beginning the subject of drawing. Any draftsman or letterer who handles his instrument awkwardly will create a bad impression, no matter how good a workman he may be. The tendency of all beginners is to use both hands for operating the compasses; this is to be avoided. The student should learn at the start to open and close the compasses with one hand, holding them as shown in Fig. 122, that

is, with the needle-point leg resting between the thumb and the fourth finger, and the other leg between the middle and fore finger. When drawing circles, hold the compasses lightly at the top between the thumb and fore finger or between the thumb, fore finger, and middle finger, Fig. 123.

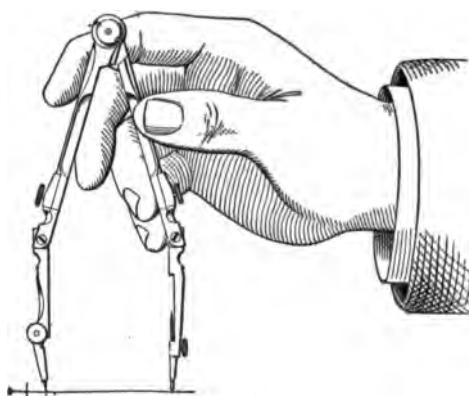


FIG. 122

Both hands should not be used in locating the needle point at a point on the drawing from which a circle is to be drawn, unless the left hand is used merely to steady the needle point. Hold the compasses as shown in Fig. 122, and incline them until the under side of the hand rests on the paper. This position will steady the hand so that the needle point can be brought to exactly the right place on the drawing. Having placed the needle at the desired point, the pen or pencil point may be moved out or in to any desired radius, Fig. 122. When the lengthening bar is used, both hands must be employed.

**139.** The compasses must be handled in such a manner that the needle point will not dig large holes in the paper.

A large hole made by the point will invariably cause a slip, and the result will be a distorted or broken line when inking in a circle. Keep the needle point adjusted so that it will be perpendicular to the paper when drawing circles, and do not bear on it. A slight pressure will be necessary on the pen or pencil point, but not on the needle point.

**140.** The **dividers**, shown in Fig. 124, are used for laying off distances on a drawing, or for dividing straight

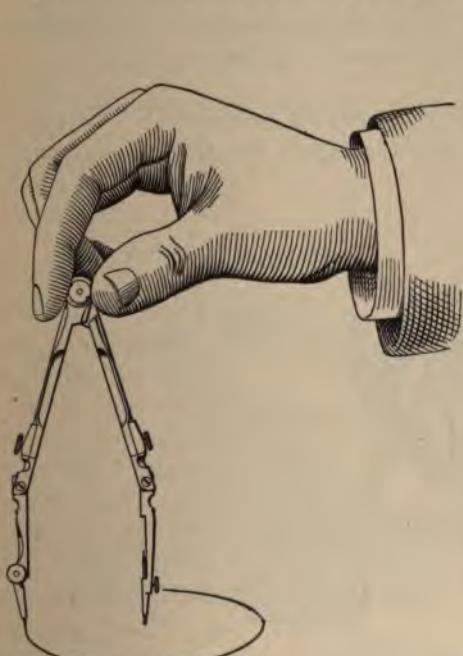


FIG. 123

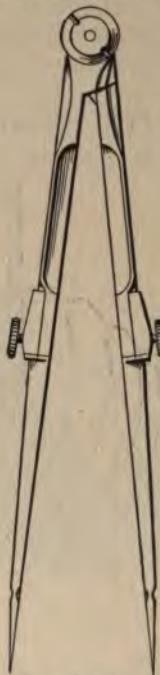


FIG. 124

lines or circles into parts. The points of the dividers should be very sharp, so that they will not punch holes in the paper larger than is absolutely necessary to be seen. Compasses are sometimes furnished with two steel divider points, besides the pen and pencil points, so that the instrument may be used either as compasses or dividers. This is the kind illustrated in Fig. 123. When using the dividers to

space a line or circle into a number of equal parts, hold them at the top between the thumb and the forefinger, as when using the compasses, and step off the spaces, turning the instrument alternately to the right and left. If the line or circle does not space exactly, vary the distance between the divider points and try again; continue doing this until it is spaced equally. When spacing in this manner, great care must be exercised not to press the divider points into the paper, for if the points enter the paper, the spacing can never be accurately done. The student may soon satisfy himself of the truth of this statement by actual trial.

**141. Drawing Paper and Pencils.**—The drawing paper required for this Course is Whatman's cold pressed

the size of which is 15 in.  $\times$  20 in. This drawing paper takes ink well, and withstands considerable erasing. The paper is secured to the drawing board by means of thumbtacks. Four are usually sufficient—one at each corner of the sheet. Place a piece of paper on the drawing board, and press a thumbtack through one of the corners, about  $\frac{1}{4}$  or  $\frac{3}{8}$  inch from

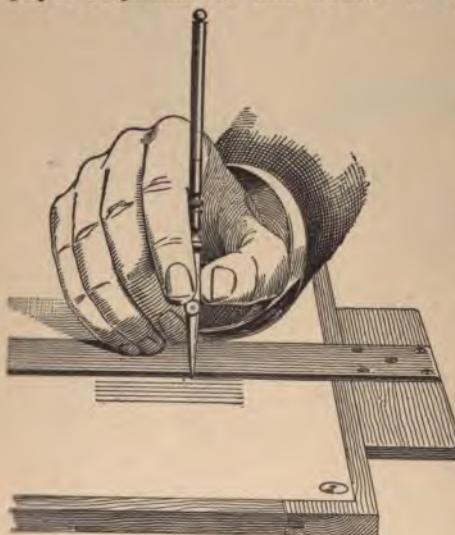


FIG. 125

the edge. Place the T square in position for drawing a horizontal line, as previously explained, and straighten the paper so that its upper edge will be parallel to the edge of the T-square blade. Pull the corner diagonally opposite to that in which the thumb-tack was placed, so as to stretch the paper slightly, and push in another thumbtack. Do the same with

the remaining two corners. For drawing in pencil, a Dixon's Artists' H pencil, No. 217 (commonly called a No. 4 Dixon's Artists') may be used. The pencil should be sharpened to a medium point. Cut the wood away so as to leave about  $\frac{1}{4}$  or  $\frac{3}{8}$  inch of the lead projecting; then finish the point by rubbing it against a fine file or a piece of fine emery cloth or sand-paper that has been fastened to a flat stick. The lead for the compasses should be sharpened to a flat or chisel-shaped point. Be sure that the compass lead is so secured that, when circles are struck in either direction, but one line will be drawn with the same radius and center.

**142. Inking.**—For drawing ink lines other than arcs of

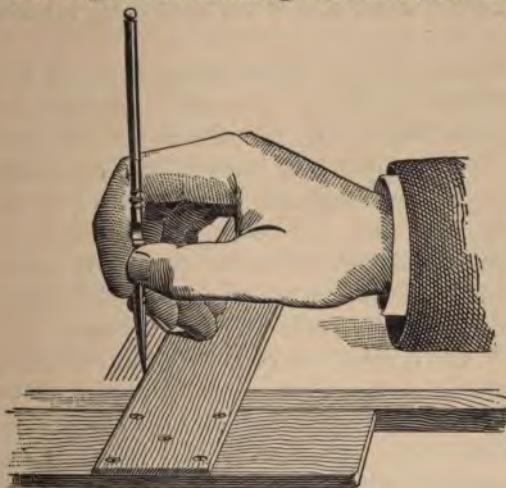


FIG. 126

circles, the ruling pen (or right-line pen, as it is sometimes called) is used. It should be held as nearly perpendicular to the board as possible, with the hand in the position shown in Figs. 125 and 126, bearing lightly on the T square or triangle, against the edge of which the line is drawn. After a little practice this position will become natural, and no difficulty will be experienced.

The beginner will find that it is not always easy to make smooth lines. If the pen is held so that only one blade

bears on the paper when drawing, the line almost invariably will be ragged on the edge where the blade does not bear. When held at right angles to the paper, as in Fig. 126, however, both blades will rest on the paper, and if the pen is in good condition, smooth lines will result. The pen must not be pressed against the edge of the T square or triangle, as the blades will then close together, making the line uneven. The edge should serve simply as a guide.

In drawing circles with the compass pen, the same care should be taken to keep the blades perpendicular to the paper by means of the adjustment at the joint. In both the ruling pen and the compass pen, the width of the lines can be altered by means of the screw that holds the blades together.

**143. Drawing Ink.**—The ink used should be Higgins' waterproof liquid India ink. A quill is attached to the cork of every bottle of this ink, by means of which the pen may be filled. Dip the quill into the ink, and then pass the end of it between the blades of the drawing pen. Do not put too much ink in the pen, not more than enough to fill it for  $\frac{1}{4}$  inch along the blades, otherwise the ink is liable to drop. Many draftsmen prefer to use stick India ink, and for some purposes this is to be preferred to the prepared liquid ink. When India ink is used on drawings that are to be subsequently colored with water colors, always use waterproof ink. In case the stick ink is bought, put enough water in a shallow dish (a common individual butter plate will do) to make enough ink for the drawing; then place one end of the stick in the water, and grind by giving the stick a circular motion. Do not bear hard on the stick. Test the ink occasionally to see whether it is black. Draw a fine line with the pen, and hold the paper in a strong light. If it shows brown or gray, grind a little longer, and then test again. Keep grinding until a fine line shows black, which will usually take from 15 minutes to  $\frac{1}{2}$  hour, depending on the quantity of water used. The ink should always be kept well covered with a flat plate of some kind, to keep out the dust and prevent evaporation. The drawing pen may be filled by dipping

an ordinary writing pen into the ink and drawing it through the blades, as previously described, when using the quill. If Higgins' ink is used, all the lines on all the drawings will be of the same color, and no time will be lost in grinding. If stick ink is used, it is poor economy to buy a cheap stick. A small stick of the best quality, costing, say, one dollar, will last as long, perhaps, as five dollars' worth of liquid ink. The only reason for using liquid ink is that all lines are then sure to be of equal blackness, and time is saved in grinding.

Trouble will probably be caused by the ink drying between the blades and refusing to flow, especially when drawing fine lines. The only remedy is to wipe out the pen frequently with a wet cloth. Do not lay the pen down for any great length of time when it contains ink; wipe it out first. The ink may sometimes be started by moistening the end of the finger and touching it to the point, or by drawing the point of the pen across a piece of linen or unsized cotton cloth, which may be dry or slightly moistened. Always keep the bottle corked.

**144. To Sharpen the Drawing Pen.**—When the ruling, or compass, pen becomes badly worn, it must be sharpened. For this purpose a fine oilstone should be used. If an oilstone is to be purchased, a small, flat, close-grained stone should be obtained, those having a triangular section being preferable, as the narrow edge can be used on the inside of the blades in case the latter are not made to swing apart so as to permit the use of a thicker edge.

The first step in sharpening is to screw the blades together, and, holding the pen at first perpendicular to the oilstone, to draw it back and forth over the stone, changing the slope of the pen from perpendicular to downwards to the right and then to downwards to the left. The object of this is to bring the blades to exactly the same length and shape, and to round them nicely at the point.

This process, of course, makes the edges even duller than before. To sharpen, separate the points by means of the screw, and rub one of the blades to and from the operator in

a straight line, giving the pen a slight twisting motion at the same time, and holding it at an angle of about  $15^{\circ}$  to the face of the stone. Repeat the process for the other blade. To be in good condition, the edges should be fairly sharp and smooth, but not sharp enough to cut the paper. All the sharpening must be done on the outside of the blades. The inside of the blades should be rubbed on the stone only enough to remove any burr that may have been formed. Anything more than this will be likely to injure the pen. The whole operation must be done very carefully, bearing lightly, as it is easy to spoil a pen in the process. Examine the points frequently, and keep at work until the pen will draw both fine lines and smooth heavy lines.

**145. Use of Protractor.**—Included in the drawing outfit is a protractor.

This instrument will be found most useful in determining the incline of letters in degrees. To understand its use, and for the benefit of students who may never have had occasion to use this instrument, it may be first stated that a complete circle is  $360^{\circ}$ ; the protractor is a half circle, and contains therefore  $180^{\circ}$ . The small nick at the center of the straightedge is the center of the circle, and from this point all lines

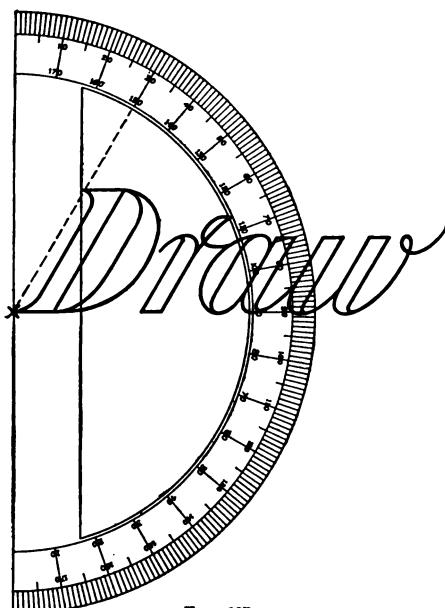


FIG. 127

are established. In mechanical drawing, the protractor is read from a horizontal base; but in lettering the incline of letters is given to the right or left of a vertical base.

The reason for this is that all letters are normal when vertical.

The protractor is graduated so as to be read from either direction, as shown in Fig. 127. It may be of further advantage to the student to state that a quadrant, or one-fourth, of a circle is  $90^\circ$ ; one-half of a quadrant is  $45^\circ$ ; and one-fourth of a quadrant is  $22\frac{1}{2}^\circ$ .

Thus, by observing Fig. 127, the student should have no difficulty in determining the incline of letters in degrees or, by drawing parallel lines, in maintaining a word or line of letters at a uniform incline at any given degree.

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#### PLATES

**146. Preliminary Directions.**—The size of each plate over all will be 15 in.  $\times$  20 in. Whenever any dimensions are specified, they should be laid off as accurately as possible. All drawings should be made as neatly as possible, and the penciling entirely finished before inking in any part of it. The hands should be perfectly clean, and should not touch the paper except when necessary. No lines should be erased except when absolutely necessary, for the dust floating in the air and constantly falling on the drawing will stick to any spot where an erasure has been made, and render it very difficult, if not impossible, to entirely remove it. For this reason, all construction lines that are to be removed or that are liable to be changed should be drawn lightly, that the finish of the paper may not be destroyed when erasing them.

## PUNCTUATION

**147. Importance of the Subject.**—There is seldom sufficient attention paid to punctuation by letterers, as may be observed on the signs on almost any public street. Therefore, the attention of students must be earnestly called to the necessity of a careful study of the rules of punctuation, in order that their work may show accuracy in this as well as in every other respect.

**148.** The apostrophe is frequently misplaced in the plural possessive case. To fully understand the rule governing the possessive case and the origin of the mark used to denote possession, it must first be understood that the apostrophe is used to indicate that something has been omitted. On the fly leaf of some very old book may be seen the name of the owner, "John Smith," and underneath, the words "his book," which was the early way of expressing the possessive. Later, it became a custom to write "John Smith's book," inserting the apostrophe to indicate that the word "his" has been omitted. By bearing in mind this simple custom, one can always locate the proper place for the apostrophe, according to the location of the pronoun. To further illustrate, take, for example, the words "men's and boys' clothing." To use the methods of our ancestors we would express it, "men, their clothing, and boys, their clothing." According to the rule, the apostrophe and final "s" should be substituted for the pronoun, making the phrase read "men's and boys' clothing." Thus, the letter "s" would not be necessary after the apostrophe in the word "men's," as the pronoun "their," which has no final "s," is used; but for euphony, or to obviate harshness of sound, the "s" is often added after many words, and also omitted from words ending with "s" for the same reason.

**149.** The comma is frequently used where the period is the mark required. For instance, the words "John Smith.

Law Office." make two complete and independent statements, and each should be terminated by a period. However, if the words used are "John Smith, Lawyer," the case is different, as there is but one statement, which should be terminated by the period.

**150.** The period is put at the end of every word, phrase, or sentence that is complete by itself, and not interrogative or exclamatory. It is also placed after all abbreviations.

Quit yourselves like men. The M. D. addressed his letter to James Howard, LL. D.

**151.** The colon is an intermediate point between the semicolon and the period, and is used as follows:

**1.** After words that promise a series or statement of something important.

His possessions, he said, were not many: a stout heart, a firm resolve, and—fifty cents.

**2.** Before an important remark added to a sentence, especially when it sums up the sentence or presents the meaning in another form.

Avoid evil doers: in such society an honest man may become ashamed of himself.

**152.** The semicolon is used to separate clauses that are themselves divided by the comma or that require a point greater than a comma and less than a colon; or to separate the parts of a loose series.

He was courteous, not cringing, to superiors; affable, not familiar, to equals; and kind, but not condescending or supercilious, to inferiors.

**153.** The comma is the most frequently used of all the punctuation marks. The chief purposes for which it is used are the following:

**1.** To separate the terms of a closely related series, or two such terms when the connective is omitted.

Hedges, groves, gardens.

It was a dark, desolate region.

2. To separate terms that are contrasted or otherwise distinguished, and terms of which a part in one might be referred improperly to the other.

He is poor, but honest.

3. To set off a word, phrase, or clause that is parenthetic, or that comes between other parts and breaks their connection.

You will then, however, be in no better condition.

4. To set off a modifying word, phrase, or clause that is not closely connected with what it modifies, or that is removed from it by inversion.

Behold the emblem of thy state in flowers, which bloom and die.

By Americans generally, the hero of the Battle of Manila Bay is beloved.

5. To set off words or phrases used independently or absolutely.

Ristalfo, give me what is mine, and that right quickly.

6. To separate the predicate from its subject, when the subject is very long, and has a clause, or consists of punctuated parts.

The fact that he is allowed to go unpunished, makes him more insolent than ever.

7. To separate clauses that are neither very closely nor very loosely connected.

There mountains rise, and circling rivers flow.

8. Short simple sentences or clauses seldom require a point within them; and phrases or clauses that stand in close connection with that on which they depend seldom require a point before them.

Tell me when it was that you saw him after he returned.

**154.** The **interrogation point** is placed after every complete direct question, whether it forms a complete sentence or only a part of a sentence.

What mean'st thou by that? Mend me, thou saucy fellow?

—*Julius Cæsar.*

**155.** The **exclamation point** is placed after a word, phrase, clause, or sentence that indicates great surprise, grief, joy, or other emotion in the speaker.

Woe unto thee, Chorazin! Woe unto thee, Bethsaida!

**156.** The **dash** is chiefly used for the following purposes:

1. To show omission caused by interruption.

*Cassius.* Yet I fear him:  
For in the ingrafted love he bears to  
Cæsar—

*Brutus.* Alas! good Cassius, do not think of him.

2. To show emphasis or suppressed feeling, or to show an unexpected turn in thought or style.

Heaven gives to its favorites—early death.

3. To set off a parenthetical phrase, especially when emphatic or when there are other points within it.

To render the Constitution perpetual—which God grant it may be—it is necessary that its benefits should be practically felt by all parts of the country.—*D. Webster.*

4. Before echoes, or where the words "that is" or "namely" are understood.

The four greatest names in English poetry are almost the first we come to—Chaucer, Spenser, Shakespeare, and Milton.

**157.** The **parenthesis** is used to enclose some incidental remark or explanation that breaks the regular construction of the sentence and can be omitted without injuring the grammatical sense.

Know then this truth (enough for man to know),  
Virtue alone is happiness below.—*Pope.*

**158.** **Quotation marks** are used to enclose words taken from the saying or writing of another person.

The doctor made the sage remark, "while there's life, there's hope."

**159.** The **apostrophe** is used to denote the omission of one or more letters.

"Tis pleasant, sure, to see one's name in print;  
A book's a book, although there's nothing in't.

—*Chatterton.*

**160.** The **hyphen** is used (1) at the close of a syllable that ends a line when the remaining part of the word must be carried to the next line; (2) to join the parts of compound words.

**161.** **Ditto marks** are used to avoid the repetition of the word or expression directly above them.

**162.** The **underscore** is a line drawn under words in manuscript or any written copy to give them special emphasis, showing that they are to be printed in **Italic** or **capitals**, one line denoting **Italic**, two lines denoting **small capitals**, and three lines **large capitals**.

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#### HOW THE WORK SHOULD BE SENT

**163. Important to Students.**—For the letter plates of this Course, copies of the plates will be sent to the student as fast as he needs them. The tube sent with this Section should be used for sending us the drawing of Plate I on finishing it. Send one plate at a time. Thus, after you finish the first plate, send it to us, and then start on the second plate. In the meantime the first plate will be examined and returned. On receiving the first plate returned by us, carefully note all corrections and suggestions that may be sent with it and observe them when drawing the succeeding plates. On no account send us the second plate until we have returned the first plate. On finishing the second plate, send that to us and start on the third plate; in the meantime we will return the second plate. Do this with all the drawing plates in the Course.

It is very essential that you strictly comply with these directions, since otherwise it will be impossible for us to point out your mistakes to you. This procedure should be strictly adhered to while you are drawing the first plates of the Course: it will enable you to make rapid progress. Do not be discouraged if there are a large number of corrections on your early plates; we are merely pointing out ways in which the drawing or lettering can be improved, so that your

later plates may be as nearly perfect as they can be made. No one can attain proficiency unless the work is criticized, and we are doing our best to help you to succeed. We should not be doing our duty if we did not point out the defects. The number of corrections is no indication of our appreciation of the merits of the drawing.

With all plates that you send to us, write your name and address in full in ink or lead pencil on the colored paper and fasten it on the back of the plate. This should in no case be omitted, as delays in the return of your work will otherwise surely occur.



# LETTERING AND SIGN PAINTING

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## INTRODUCTION

**1. Scope of Subject.**—**Sign painting** does not consist merely of painting letters on sign boards or windows; it includes all classes of work, from the plain black lettering on the glass of an office door to the most artistic pictorial designs used on banners and other elaborate gilded and silvered signs. The sign painter must also be prepared to execute all manner of designs for the carver and stone cutter, and even portraiture, for such purposes as campaign and society banners, enters into his industry.

**2. Qualifications Necessary.**—The sign painter should be a master of the art of designing, for, as we have already stated, under this head is embraced a general knowledge of all that is considered artistic. He should be thoroughly familiar with the use of colors, having due regard for their harmony and contrast, and with the many effects that can be produced by their unlimited combinations; he should be familiar with the result of applying one color over another, when one has been prepared so as to dry slowly, and the other prepared to dry quickly; also, with the results produced by the varied preparation of the priming, groundwork, and finishing coats, the mixing of colors for certain backgrounds, or the treatment of the material on which he is to letter. These and a great many other subjects, which constantly arise, must be met and fully understood, to fulfil the demands made on the successful and up-to-date sign painter.

**3. Experience and Theory.**—While theoretical knowledge is the basis of all proficiency in the arts, much remains to be learned from experience. The physician is graduated from his college with a full knowledge of his profession, but a year or two of hospital service is incumbent on him before he is fully qualified to engage in private practice. In *Elements of Lettering*, therefore, is comprised the knowledge necessary to qualify the student that desires to become a practical letterer. However, the instruction contained in the following pages is of such a practical nature as to advance him in lettering, so that he may enter the sign shop a year or two ahead of the novice, from whom a period of servitude is required, and with a complete knowledge of the methods and formulas employed, ready to become at once of practical assistance to his employer.

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## PRACTICE AND MATERIALS

**NOTE.**—To make the instruction contained in the following pages of practical advantage to the student, he should, after reading ~~the~~ Paper through carefully, go over it again and try every method operation taught. If you thoroughly understand the instruction ~~you~~ can answer the Examination Questions, do so, but continue to practice on the work. If, after a fair trial, you encounter difficulties, advise us, giving a careful outline of your progress, and we will then assist you.

For all methods and operations on glass, sheets of glass 12 in.  $\times$  15 in. may be used; on wood, pine boards  $\frac{1}{2}$  in. thick, 6 in. wide and 3 ft. long should be procured. Other material, such as sheet brass and aluminum, may be purchased in small pieces suitable for experimental purposes.

On the completion of this Paper, if the student wishes information as to the most reliable dealers in various materials required in sign painting, it will be cheerfully furnished.

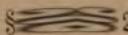
**4. Brushes for Practice.**—The brushes for practice work should be as follows: The No. 5 red sable (rigger) shown in Fig. 6 should be used for lining, striping, and for outlining letters. Three ordinary camel's-hair brushes may be used in making letters of various sizes for practice. These are shown in Fig. 3. In fitting camel's-hair brushes with handles, cut off half the length of quill, after softening in warm water to prevent it from splitting. Thus, in holding

the brush, the fingers will be above the quill; otherwise, the quill not being perfectly round, an imperfect line or curve will result when the brush is twisted as the line or curve is being drawn.

**5. Card Black.**—The color known among letterers as **card black** will be found to be a good preparation for practice work. This color flows freely from the brush, is an intense black, and dries with a glossy surface a few moments after the application. It may be prepared by the student as follows: Use a vessel that will hold at least  $\frac{1}{2}$  pint; in this put coach black (ground in japan), equal in bulk to a large English walnut; add three times this quantity of best asphaltum and about a tablespoonful of best coach japan. Stir until thoroughly mixed, and thin this with a small quantity of turpentine until it will flow freely from the brush. Should the black, for any reason, fail to appear a jet black, more coach black may be added. The asphaltum is used to give the letters a glossy or varnished appearance; therefore, if they are not bright and glossy, add more asphaltum. Put this mixture in a large-neck bottle with screw-cap or cork top. The mixture should be well shaken before it is used.

Water-color preparations known as letterine and **mark-a-line** are excellent mixtures. The student should never use in water color a brush that has been used in card black without first cleansing it thoroughly in turpentine and afterwards with soap and water. It is better, however, not to change brushes from water color to oil paints, or from oil paints to water color, as soap and water is liable to take the natural spring out of the hairs of the brush. While the card-black preparation contains no oil, it is classified as an oil color; letterine is purely a water-color preparation.

Brushes used in card black or in oil colors should be cleansed thoroughly in benzine and dipped in kerosene oil before they are laid aside, while it is only necessary to rinse brushes in water after using them in water color. The kerosene oil should be rinsed out of the brush in benzine before it is again put in color.



When water colors are to be used and flowed over the black lettering or lines, waterproof India ink, or card black, should always be used. By so doing, the liability of the water color working up into another and resulting disastrously is avoided. Higgins's or the Technical Supply Company's waterproof India ink will serve the same purpose as card black.

**6. Paper.**—For practice work, the most inexpensive material may be used, such as light Manila pattern paper, white cardboard, or ordinary white paper. With the exception of cardboard, these should be securely fastened to the drafting table before beginning to practice.

**7. Practice With the Brush.**—It is necessary that the student desiring to apply his knowledge of lettering especially to sign painting should become accustomed to the use of the brush and paint, by confining his practice to these materials as much as possible. It is only by constant practice that the hand becomes skilled in the use of the brush, able to form straight lines and curves with accuracy, and give to each letter its proportionate width and a uniform stroke. The student may supply himself with brushes, marking-a-line, letterine (white and black), artists' materials, Russian glass, etc. through the Technical Supply Company, Scranton, Pennsylvania, if he is unable to procure the required kind from local dealers.

While the work of drawing the plates with a drafting pen and filling them in with the point of a red-sable brush is excellent practice in itself, yet it is equally profitable for a student in sign painting to reproduce the letters of every alphabet in various sizes. By so doing, he soon acquires a perfect control over the brush, and is enabled to draw to a straight line and turn all curves with ease, making them true and symmetrical in outline.

**8. System to be Followed When Practicing.**—First with a No. 5 red-sable brush and India ink, draw a number of parallel vertical lines; then draw parallel horizontal lines; next, parallel oblique lines, from left to right, downward.

and from right to left, downwards, as shown in Fig. 1. In forming letters, draw all strokes downwards, and from left to right. Do not bear heavily on the point of the brush, but

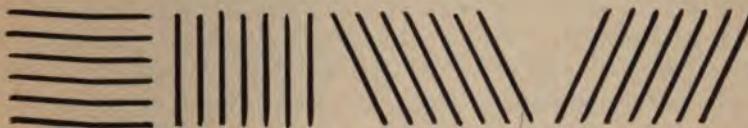


FIG. 1

make a stroke of the width most natural to the size of the brush. Keep the index finger and the thumb straight when using the brush, allowing the brush to rest as lightly as possible between them. An even, uniform line cannot be drawn with the fingers in a cramped position. After drawing parallel lines until satisfied that he can draw them straight and uniform in width, the student should continue with curved lines, such as occur in the outlines of letters. Begin with a simple ogee line, drawing several others under and parallel to it; then follow with double ogee lines, crescent strokes, ovals, ellipses, and cymas, in the order shown in Fig. 2. The student is now ready, having mastered these

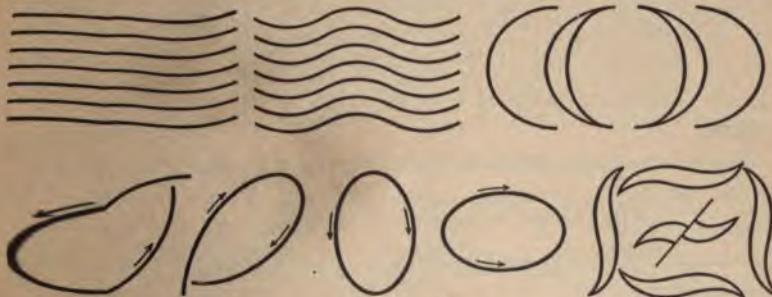


FIG. 2

curves, to outline the letters of each alphabet as he proceeds with his studies. When the freehand alphabets have been reached, he is recommended, for practice, to outline these letters with black, fill in their faces artistically, and shade them in various ways, using water colors for filling in and shading.

**METHODS USED IN SIGN PAINTING**

**9. General Tools and Appliances.**—The principal tools necessary for sign painting and lettering are the **T square**, boxwood square, compass with pencil attachment, straight edge, yardstick,  $30^{\circ}$  and  $45^{\circ}$  triangles, easel, and drafting table. With these tools, one is prepared to letter all ordinary signs that may be executed within the shop; while those on the sides of buildings, too high to be reached with an ordinary ladder, require the use of a swing scaffold, tackle blocks, and ropes. Trestle horses and plank are also used for work above the reach of the step ladder. The **T square**, with swivel tool and thumbscrew, can be adjusted to any angle, and will be found a very useful tool. Three compasses, at least, should be used; the largest (the wooden compass) should be capable of an expansion of 3 feet. The sign easel should be made of extra-heavy material, as the weight put on it is sometimes very great. The drafting table should be constructed high enough to save the letterer from getting into a stooping position when working. For the letterer of average height the table should be 3 feet 2 inches high in front, so that he may always work at it standing. For close work, which can be done as well, or better, while sitting, a lower table should be used, adjusted accordingly; in either case, the incline should not exceed 6 inches rise to 20 inches in width—about  $15^{\circ}$ .

The paint stand, an important piece of sign-shop furniture, should be made wide enough to permit of two marble or plate-glass ends, 12 or 14 inches square. At the rear, a top should be constructed with two cupboards, one at each end; between these there should be fourteen small drawers, in two tiers, and underneath these two shelves should be fitted. The cupboard is most convenient for gold and silver leaf, bronzes, and all other material that should not come in contact with paints and oils. The drawers are used for dry colors, and the shelves for colors and paint cups.

On the plate glass or marble, all colors are ground and mixed by the use of palette knives, but large quantities of

color that does not require grinding may be mixed in large pails or cans

**10. Improvised Appliances.**—There are many tools and contrivances used in a sign shop that an inventive brain can always improvise, such as the arm rest, which is a strip about 3 inches wide by 1 inch thick, supported at each end by blocks placed on the table, and thick enough to raise the rest above the sign on which the letterer is working; the adjustable frame on which cloth signs are stretched while being lettered, the frame usually being fastened at each corner by setscrews; the glass-sign racks, used to hold glass signs and insure their safety during the process of lettering; or the adjustable frame used to hold finished work. The ordinary tools necessary in a sign shop, such as palette knives and palettes, are too well understood to need any description. A firm, level-topped table, about 18 in.  $\times$  24 in., covered with plate glass, will be found very useful in mixing colors; if made light and portable, this can be used conveniently by placing it beside the work on which the letterer may be engaged.

**11. Brushes.**—The brushes to be used for lettering will be described first. Of those used exclusively for this purpose, the most common variety is the ordinary camel's-hair brush. These are the least expensive, and range in size from the  $\frac{3}{4}$  inch, known as No. 7, to the swan quill, which is



FIG. 3

the most stocky quill brush in use for lettering. The goose quills are made in four sizes, Nos. 7, 5, 3, 1. No. 1 is  $\frac{1}{4}$ -inch quill with hair  $1\frac{1}{4}$  inches long. The largest size being seldom used, Nos. 3, 5, and 7 only are shown in Fig. 3.

**12. Ox-Hair Writers.**—The ox-hair writers, or brushes, are similar to the camel's-hair brushes in size and

numbering, but are harder to break in, or bring into perfect working order, and are used to best advantage in heavy color, such as white lead.

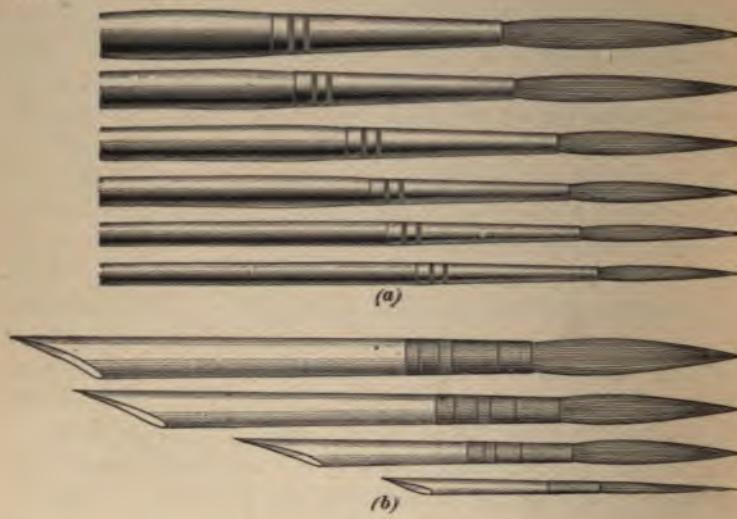


FIG. 4

There are two varieties of ox-hair writers—the extra fine, set in tin ferrules with polished-wood handles, shown in Fig. 4 (a), and the ordinary quill brushes shown in Fig. 4 (b).

**13. Superfine Brown-Sable Writers.**—The **superfine brown-sable writers** are of several sizes. The sizes generally used are Nos. 1, 4, 6, and 8, and their lengths correspond to those of the camel's-hair brushes. These will be

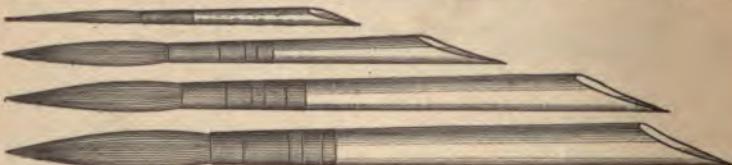


FIG. 5

found excellent brushes, and when thoroughly broken in will give good service; while the camel's-hair brushes are unreliable in lasting quality, but serve the purpose where the

brushes made. They range in sizes from Nos. 1 to 8, shown in Fig. 7, and are known also by the name of *Camel's hair*. These brushes are used for lettering as well as shading. The stroke of the letter and the shade being made with one

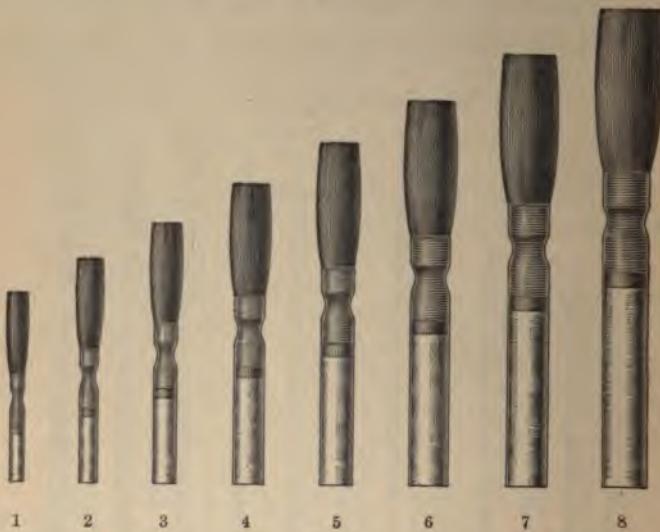


FIG. 7

sweep of this style of brush, they are a means of great economy in time for all work not requiring absolute accuracy.

**16. Swan Quill.**—The swan quill (camel's hair), already referred to, will be found invaluable, both in

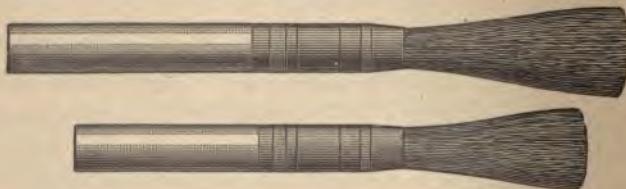


FIG. 8

lettering and striping, on account of the great amount of color it can be made to retain. These brushes are used with light flowing color only; to use them in any color made

with white lead would ruin them at once. There are two sizes that are most suitable to the requirements of a sign painter: the 1-inch and the 1½-inch size; another size, made for carriage stripers, is 2 inches long. The first two sizes are shown in Fig. 8.

**17. Other Brushes.**—**Fitch** and **bristle varnish brushes** are used for lettering on cloth signs and other signs calling for large letters; on account of their size and chisel shape they can be used with great rapidity, and will give the work an appearance of neatness and cleanliness. Other brushes used by the sign painter are the **pound brush**, which is necessary to coat sign boards or other plain surfaces; the round and flat sash tools; the **fitch**, or flat bristle brush; and the flat **bear's-hair brush** (made exclusively for varnishing purposes). These constitute all the brushes required for sign painting and lettering, except the round **duster** and the several varieties of gilding brushes, blenders, stipplers, etc.

**18. The T Square.**—On all signs having either a square top or a square bottom, the **T square** can be used, not only for marking out the letters, but also for guiding the hand in using the brush, though to accomplish this perfectly requires much practice. It will be advisable, therefore, for the student to study and practice this method and become accustomed to the position of the hand and the manner in which the brush should be held. Fig. 9 shows this position. The brush is held between the thumb and the first finger, the handle pointing toward the letterer, allowing the three fingers to guide the hand along the edge of the **T-square** blade. The left hand is used to keep the square in position, either by holding it firmly at the head, when working on a narrow sign, or at the end of the blade, when working on a wide sign, which will prevent the square from slipping if the forefinger is rested against the bottom of the sign board, as shown. By the use of the **T square** and this method of striping, the letterer can draw all vertical and angle lines, having first, by the same method, striped all horizontal lines, using a straightedge for this purpose instead of the **T square**,

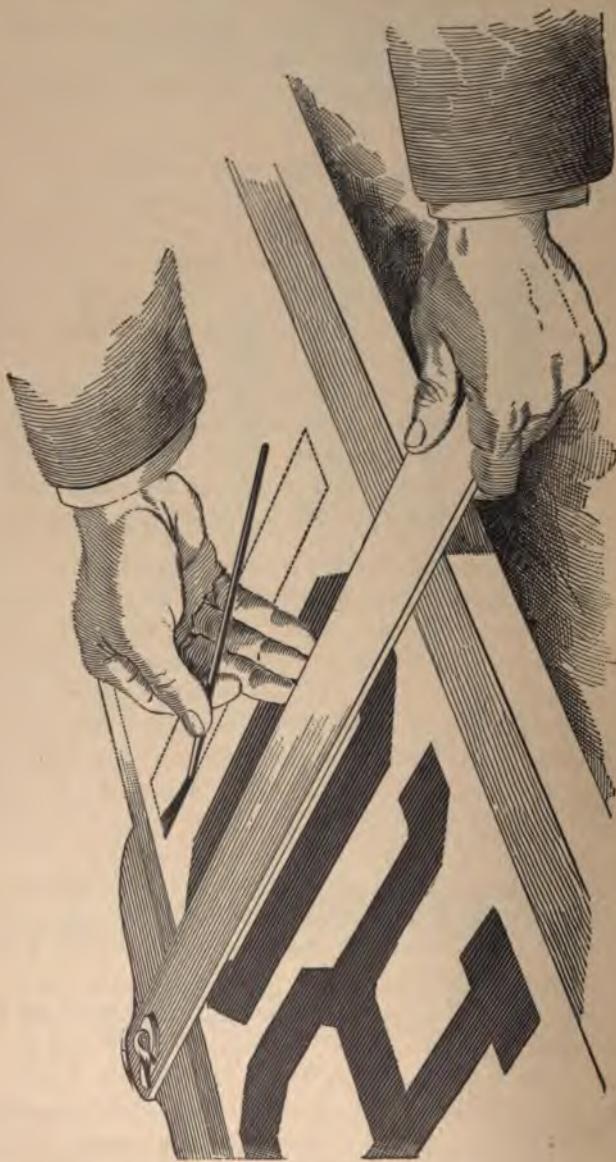


FIG. 9

but maintaining the same position of hand and brush. The block, half-block, and all straight-line letters of any style can be made with great rapidity in this manner.

#### POSITION OF HANDS IN STRIPING AND LETTERING

**19. Usual Position.**—The left hand should rest in an easy position, projecting the little finger, to steady it; this also gives a greater scope in making a stroke. The right hand should rest comfortably on the left, and be posed in such a manner that the little finger of the right will come between the thumb and the forefinger of the left hand, holding the brush in the same position as in writing, as shown in Fig. 10.

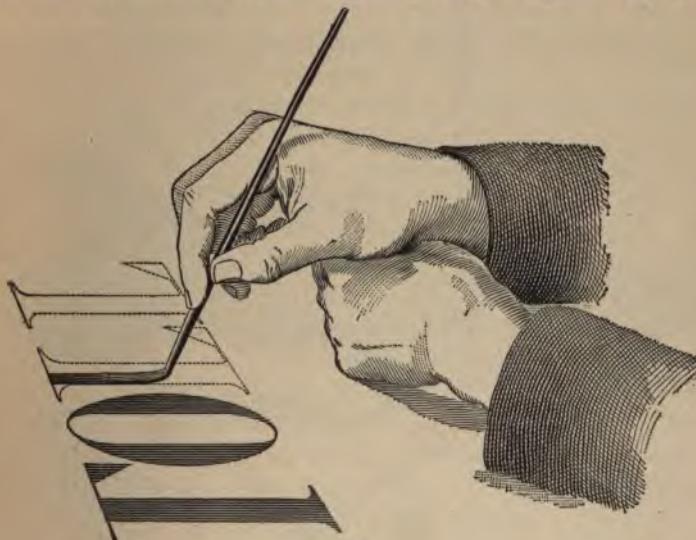


FIG. 10

**20. Position in Making Large and Small Letters.** Although this may seem somewhat awkward at first, it will be found, on practicing a little, that it is the most natural and comfortable position, as well as the one by which the best work can be accomplished. It allows perfect freedom of the hand in making all strokes of the letter, giving a greater scope in making large letters than any other position

or method; it also forms a rest, giving the letterer entire control over his brush. By constant practice, a perfectly straight line may be drawn with the brush, either vertically or horizontally. When making letters under 1 inch in height, it is best to use but one hand in the position used in writing; a red-sable brush, from No. 1 to 5, according to the size of letter, will be found to fill the requirements for small lettering.

**21. Position When Striping.**—There are but three methods of striping with a brush, all of which are employed by the sign painter. The first of these, and the one most generally used, is shown in Fig. 9. By this method, the

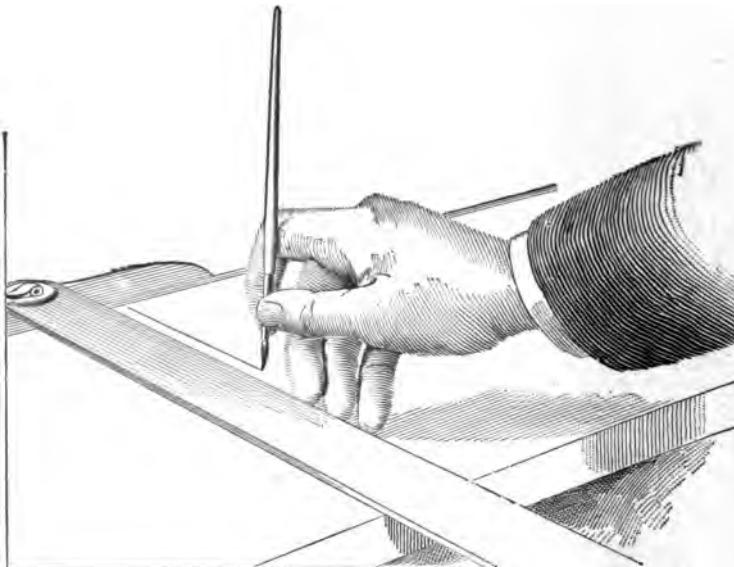


FIG. 11

brush is drawn over the surface, spreading its hairs somewhat, and touching the surface with almost the entire brush length, the letterer at the same time being careful to keep the width uniform. In some cases, when striping by this method, it is necessary only to observe the line made by the brush on one side, as in lettering or striping to the edge of the letter.

This system the carriage painter uses exclusively, and for a brush he uses the one known as the **sword pencil**, a long flat brush with which he can make the stripe called the **fine line**, which is almost a hair line.

**22. Striping With the Point of a Brush.**—To accomplish the same results, the sign painter employs an entirely different method, producing equally as fine and perfect a stripe, but using the point of the lettering brush, or pencil, called also the *writer*, by holding the brush at a right angle with the surface on which he is working, and allowing the fingers to guide the hand. The brush used for this method must be one that is either drawn to a slight chisel-shaped end, and turned edgewise to produce the finest line possible, or one that possesses a good point, which will not allow any of the hairs to spread while using.

To master this method of striping, it will be good practice for the student to lay a straightedge on a sheet of paper, or cardboard, and draw fine lines, maintaining the position shown in Fig. 11, until the perfectly straight hair line has been accomplished. This will require considerable practice. Use the same brush, well filled with water or oil color, and practice the broad stripe by the method shown in Fig. 9. The brush for this purpose should be rather large, as a small one will not spread the color to the full width of the stripe desired. The effort to accomplish this by means of a brush that is too small will cause an irregular or wavy stripe; while the large brush will make the broad stripe with the hair in its normal position, and no great pressure, therefore, is required.

Great care should be used in the selection of brushes for every class of work, especially for striping. A brush that holds together well at the point, and does not come to a point too abruptly, is the best brush for striping.

**23. Border Striping.**—To stripe by the method shown in Fig. 12 (which is the most difficult of all to accomplish), the brush should be held firmly between the thumb and forefinger, allowing the handle to rest against the fleshy part of the thumb; the three fingers remaining free are used to guide

the hand. A piece of cardboard will be found to be an excellent material on which to practice this method of striping. The beginner should at first run a stripe quite near the edge of the cardboard, about  $\frac{1}{4}$  inch from it.

It would be well first to mark the line lightly with a lead pencil, using a straight-edge. Then draw an even, straight line with the brush. To avoid the possibility of making what is known among stripers as a *fat line*, that is, a line wider in some parts than in others, the hand should be kept at a uniform distance from the surface of the cardboard. This method of striping requires much practice, and is accomplished through perseverance. The first attempts will

show irregular and wavy lines of various widths; it is possible in a short time, however, to make a hair line at any required distance from the edge of the cardboard.



FIG. 12

## COLORS

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### CLASSIFICATION OF COLORS

**24. Primary, Secondary, and Neutral Colors.** Colors are divided into three classes: **primary, secondary, and neutral.** The semineutral colors, holding a place between the secondary and the neutral, are classed with the latter.

The primary colors are red, yellow, and blue. By a mixture of any two of these, a secondary color is produced; and, by the addition of white or black in combination with the primary or secondary colors, all neutral colors, shades, and tints are produced. A combination of red and yellow produces the secondary orange. A combination of yellow and blue produces green. A combination of red and blue produces purple. The union of black and white produces lead color.

A color is neutral when the two colors composing it are so evenly divided in strength that one does not dominate the other; such colors as yellow-green, blue-green, and red-orange are neutral colors. A combination of the three primary colors, in proportion to the strength of each, produces a neutral color. Combinations of the three primary colors in unequal proportions produce colors known as **tertiary** colors.

The trade term *color*, as applied in sign painting, always refers to any mixture that produces a separate hue. This may be a combination of primary or secondary colors, or of a primary with a secondary, or of either primary or secondary with black or white or of black with white. In the accompanying color chart is shown the spectrum, also the primary and secondary colors. The spectrum consists of twenty-four distinct colors. By referring to the plate, it will be seen that the color midway between any two colors is neutral, and the

two next adjoining it partake of the color next to it. For example, the neutral between red and orange is red-orange, and between the red and red-orange is the red red-orange. The overlapping of the primaries shows also how the secondary colors are produced.

**25. Producing Shades.**—The various shades of a color are formed by mixing a strong primary or secondary color with white, securing several shades of different strength until the color has become indistinct, when it is termed a **tint**. Colors strengthened with black also produce shades. A combination of red and green produces brown. Of this color, there are many shades. Burnt and raw umber, and burnt and raw sienna, in their natural, or raw, state, are brown pigments; the burnt, or darker, shade of each is produced by chemical treatment.

**26. Semineutral Colors.**—Brown, gray, and maroon, also the color produced by mixing blue and green neutrally, give rise to the other classification, called the **semineutral colors**. From the six principal colors come the great variety of colors into which each principal color is subdivided.

**27. Warm and Cold Colors.**—Colors are in harmony with each other when they partake of the same general effect, such as chrome yellow and sienna, chrome yellow and umber; or colors or tints of red or yellow, and are called **warm colors**. Those of the opposite nature, such as gray, lead color, green, blue, etc., are called **cold colors**.

**28. Contrast.**—Colors are in contrast when warm and cold colors are used in connection with each other, although all warm and cold colors cannot be used in connection with each other without producing a heterogeneous effect, as with certain shades of red and green, blue and green, blue and red, etc., which are most discordant to the eye when placed close together. Coloring, therefore, is a study that can be accomplished by close observation and experiment. Just as the professional musician produces combinations of sound that thrill us, so the professional colorist produces effects.

that are beyond the comprehension of the unskilled. More particularly is this true in the case of the artist that imitates nature. He may follow nature so closely as to not only deceive the eye, but also produce combinations that will be most pleasing to it.

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#### APPLICATION OF COLORS

**29. Color Relations.**—The application of colors does not merely involve a knowledge of the many ways in which colors can be transferred to a surface, but it demands a knowledge of the nature of the colors themselves, the effect of the elements on each, and the relations they bear one to another. According to these relations, colors are classified as either harmonizing or contrasting with other colors. A colorist should understand the result, especially in regard to drying, of placing one mixture on another, each having as a base an entirely different medium or liquid. All these details must be considered by the painter, and many annoyances and serious complications can be avoided by bearing in mind the important instructions here given.

**30. Drying Qualities of Colors.**—Colors mixed with slow-drying liquids, such as oils or varnishes, can be covered, while they are still quite tacky, with a coat of the same or of another color. But to cover such a surface with a color mixed with some quick-drying japan or varnish will result in a crackled, pebbled, or uneven surface when the underlying color dries. One surface should be perfectly dry, therefore, before another is applied. The same result will be produced should a slow-drying color be placed over a quick-drying one, if the latter is not perfectly dry before the second is applied. This can easily be understood, as the quick-drying color contracts or shrinks in drying, while the slow-drying color, mixed with oil or varnish, is of a flowing or expanding nature. As the under color continues to dry after being covered over, its contraction causes the result that has just been described.

**31. Durability of Colors.**—Colors mixed with the best coach varnish will stand longer when exposed to the weather than when mixed with any other material, and raw or boiled linseed oil is next in value for the same purpose; but colors mixed with japan or turpentine possess little durability. English vermillion is a color that cannot be used for outside purposes with any assurance of its remaining long or holding its original brilliancy. This color is a pigment of mercury and sulphur, and when exposed to the elements bleaches out to a dull pink, about the strength of flesh color. The American, or aniline, vermillion is one of the many products of coal tar, and its nature is directly opposite to the English vermillion, for after exposure to the elements it turns a very dark brown. These effects may be somewhat modified by mixing the two together, but at best the color is not one to be used freely for outside work.

**32. Durability of Lampblack.**—Lampblack will outwear all colors. It is often seen on signs that have stood many years of exposure, where the black has remained with a good surface, while the three or four coats of white-lead ground color have entirely disappeared, together with portions of the wood, giving the sign an embossed appearance. Blues are not lasting, as a rule, while all other colors may be considered about equal in durability.

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#### RULES FOR COMPOUNDING COLORS

**33. Stock Colors.**—A sign painter's color cupboard is a most essential part of his equipment. It is important, therefore, that its contents be considered, and that much study be given to the preparation of all the colors to be used. The attention of the student is first directed to those colors that may be most profitably purchased in original packages, ground in oil or japan, to suit every requirement. These may be designated as **stock colors**, for the reason that every paint dealer carries such colors in stock. The sign painter should be supplied with a complete stock of these colors, and with oils, varnishes, japans, etc. In what follows

to show scratches when the lettering is completed and the whiting removed. To remove the whiting, dust it off carefully with a soft hair brush or feather duster, and finally rinse the surface with clear water, and dry with a moistened chamois skin.

#### PREPARATION OF SURFACES

**75. Foundation Work.**—There are many kinds of surfaces to be dealt with in lettering, for the letterer may be called on to place letters on any solid material known. A sign board, when first turned over to the sign painter from the sign carpenter, may possess solid knots or streaks of pitch, either of which will show through many coats of color unless their penetrating quality is destroyed. This is done with orange shellac, applied after the board has been thoroughly dusted off. When the shellac is dry, the sign is ready for the first coat of paint, called the *priming coat*. This must invariably be white lead mixed with boiled linseed oil only. When this has dried, and the board has been run over lightly with sandpaper and dusted, all nail holes or other defects are filled with putty, after which the second coat is applied, which should be mixed with one-fourth turpentine to three-fourths boiled oil. This coat also is sandpapered, and then the third, or finishing, coat is applied. The third coat, a mixture quite different from that used for the second coat, should consist of about two-thirds turpentine to one-third boiled oil; this will insure a flat- or dull-finished surface to work on.

**76. Defects Avoided.**—A glossy surface will cause trouble if allowed to stand some time before being lettered, as the placing of one oil color on another is liable to result in the second one creeping, that is, leaving the ground surface, causing large or small pitted spots to appear. This may be avoided by rubbing the surface with curled hair, or with pumice stone and water, or by dusting a small quantity of whiting over it. White enameled oilcloth is used extensively for lettering purposes; to insure against the difficulty described, benzine or turpentine should be rubbed on the surface with cotton cloth or batting.

**77. French-Enamel White Finish.**—If a French-enamel white finish is desired, the sign should be painted evenly with three coats, as described above, followed with three coats of white *rough stuff*, applied as paint. Rough stuff is described in Art. 79. A coat of lead color, known as the *guide coat*, should then be applied. This should be rubbed down, the day after its application, with white lump pumice and water, until the lead color has entirely disappeared. For finishing this surface, equal parts of Florence white and zinc white are mixed with special light rubbing varnish, prepared especially for white. One coat of this mixture is applied, and the day following it is again rubbed with the ground pumice. If not evenly covered, a second coat of zinc white and Florence white is necessary, and also another rubbing; after which one coat of best damar, or light English finishing varnish, colored well with zinc white and Florence white, is flowed on, enough of the white being used to change the color of the varnish, but not enough to make it a solid color.

**78. Carriage, or Piano-Body, Finish.**—To make a carriage, or piano-body, finish, the sign should be painted with three coats of white lead, as previously directed, adding black enough to produce a lead color; after which the surface is given several coats of ordinary rough stuff. At least four coats of rough stuff should be applied before the guide coat of black or red. It is then rubbed down with lump pumice and water, after which the sign is ready for the finishing coats. If a black finish is desired, the surface is given a coat of coach black ground in japan. This is followed with two coats of rubbing varnish, colored well with black, each coat being rubbed with ground pumice and water (using curled hair for the rubbing). One coat of best coach finishing varnish is then flowed on in a room of high temperature and free from dust or draft. When the sign is dry, it possesses the finest finish possible to produce, if the work has been properly done. Should any color other than black be desired, the color may be substituted in place of the black on the first

coat, after rubbing down the rough stuff. The rubbing varnish also should be colored accordingly. This process can be followed on all sheet-metal or iron surfaces, on which the roughness may be overcome by filling well with a putty made of white lead and whiting, laid on with a wide-blade putty knife.

**79. Rough Stuff.**—**Rough stuff**, so generally used in carriage painting, is a mineral. It is ground into powder, and in this form it may be purchased from paint dealers. On account of its lithoidal (stony) nature, it grinds down, under pumice, to a smooth finish not equaled by any other substance that can be applied with a brush. In order that it may dry hard, and within 24 hours, it is mixed with rubbing varnish and coach japan—two-thirds rubbing varnish to one-third coach japan.

**80. Pumice.**—**Pumice**, such as is commonly used by carriage painters, is lava, the best being that obtained from volcanoes recently active. The porosity of this stone renders it so light that it will float in water. It may be cut and flattened, and so used to grind down surfaces of paint or rough stuff, the surface undergoing treatment being kept well covered with water. Pumice, when ground to a fine powder, is likewise used for polishing and for rubbing varnished surfaces.

#### TRANSLUCENT BACKGROUNDS

**81. Frosting on Glass.**—When lettering is to be done on glass, the glass is often frosted to render the lettering more conspicuous.

Frosted glass serves also the purpose of a door transparency; and it is often used in windows opening into a hall or area. By the use of sour beer and Epsom salt, a frosting may be produced that closely resembles the fantastic marking of the natural frost on the window pane; but the frosting usually effected by the sign painter is produced by the use of sugar of lead (in tube) or white lead. The former, having less body, or substance, is made to imitate more closely the

frosting produced by the *sand-blast process*, and is applied with a large brush as thinly and evenly as possible, and stippled with a brush made especially for this purpose, or with a pad of unsized cotton cloth filled with cotton batting. White lead used for this purpose should be mixed with two parts of boiled oil to one part of turpentine, and applied in the same way as sugar of lead. When it is desired to render the lettering as prominent as possible, the white lead is used; it being opaque when applied, the result is much whiter than in the case of sugar of lead.

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#### SIZES FOR GILDING

**82. Gilding Water.**—In the preparation of size for gilding on glass, the greatest care must be observed to exclude even the smallest particle of oil from the vessel in which it is prepared. In fact, the most scrupulous cleanliness is necessary throughout the preparation of the size, as the faintest trace of any foreign matter will materially injure the gilding.

Size for gilding on glass is prepared by dissolving in a pint of pure water a piece of Russian isinglass about the size of a silver dime. The vessel containing the water is then placed over a gas stove or coal fire and brought rapidly to the boiling point. After boiling about 30 seconds, it is removed from the fire and allowed to cool; it should then be strained through a perfectly clean piece of muslin, after which it is ready for use. This gilding water, or size, must be prepared fresh every day, as it is practically useless after 24 hours; and it should, if possible, be made with distilled or fresh rain water, the former being preferred.

Gelatine, the kind used for domestic purposes, is often used in the preparation of gilding-water size. The amount of gelatine must be determined by the student by actual experiment. A sign painter usually takes between the thumb and forefinger all that is required. By preparing the size several times, the gilder soon learns the exact amount necessary. Russian isinglass (not mica) is a fish-glue

Preparation, and while this is quite expensive, it is the best material to use; only a small amount is required at one time. Russian isinglass is usually obtained at a drug store. German isinglass is often sold for Russian. The latter is more porous. One accustomed to using the two materials can easily distinguish one from the other. There is also a domestic isinglass on the market, which is similar to the German. The student is advised to procure the best quality, in order that the best results may be secured. Proof alcohol is often added to gilding water after it has been boiled—about one tablespoonful to a pint of gilding water. This gives the gilding added brilliancy and assists the evaporation of the size from the glass. Students living in towns where Russian isinglass cannot be obtained may procure this direct from the Technical Supply Company, Scranton, Pennsylvania, at a cost of 65 cents per ounce, prepaid.

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#### SIZES FOR OIL GILDING

**83. Various Uses of Sizes.**—Sizes for gilding on wood or metal are of two kinds: *slow size* and *quick size*. The former is used when the sign or surface to be gilded is large, and will require considerable time to complete; while the latter is used on small zinc or japanned iron signs, where the letters are small and the entire gilding can be completed in from 1 to 5 hours.

**84. Slow Size.**—Slow size is made from boiled linseed oil. The oil is allowed to stand in a warm place until it is about the consistency of molasses, when it is called *fat oil*. Equal quantities of fresh boiled oil and coach maker's japan are then mixed together; this mixture and the fat oil are united in equal proportions, together with a sufficient quantity of chrome yellow to render it easily seen during its application to the surface to be gilded. These, when thoroughly stirred together, will form a size that will stand from 15 to 24 hours. The drying qualities of the slow size are influenced by the temperature in which it is allowed to stand.

In using this slow size, it must not be allowed to ~~be~~ thickly over the surface, but should be brushed out ~~evenly~~ cover the entire surface, to which it is applied to an ~~even~~ depth. If one part of the coat is thicker than another, will not dry to the surface of the sign, and will afterward break through the gilding when the surplus gold leaf is ~~bein~~ removed, or when the gold is burnished. This size will ~~kee~~ ready for use for a long period if placed in a corked bottle or tightly capped jar.

**85. Quick Size.**—Quick size is made in several ways according to the length of time to be given it for drying. This, of course, is governed largely by the amount of ~~work~~ ahead of the letterer. About thirty drops of boiled oil added to  $\frac{1}{2}$  ounce of japan gold size will constitute a size that will ~~dry~~ in about 2 hours. This can be made a quicker-drying size by reducing the quantity of oil. But to add oil in excess the quantity prescribed above will produce an unreliable mixture; therefore, another preparation is necessary where a slower size is required. The above size should be colored with a little orange or lemon chrome yellow, well mixed together on a glass surface with a palette knife.

**86. A Moderately Slow Size.**—A size that will stand longer than the above is prepared by stirring, in  $\frac{1}{2}$  ounce coach finishing varnish, about thirty drops of coach make japan. This will stand for 4 or 5 hours. In all work of importance, it is advisable to test the size on a piece of the material to be gilded, in order that the length of time it will stand may be accurately known. Different surfaces require different sizes. Some work requires a size that will stand for 24 hours, while on another material it would be ready to give in 3 hours or sooner. The reason for this is that slow size cannot be made to produce an even or sharp edge on smooth surfaces. This size may be preserved in a tight jar in the same manner as the one previously described, though it has a much stronger tendency to become thickened. Better work can be produced with a quick size freshly prepared, as it not only flows from the brush more freely, but is more

**reliable** in drying. Either of the foregoing quick sizes may be thinned, if necessary, with a little turpentine, but too much turpentine will destroy the luster of the gold.

**87. Proper Material Necessary.**—It will be observed, by one familiar with the action of the elements on certain colors, that signs on the exterior of buildings will show the effect of the elements very soon after their exposure to the weather, if the size used on them was improperly prepared. A common mistake is the use of yellow size for aluminum leaf or bronze, which is likely to show through these metals. Size for such materials should be made with about 2 ounces of light coach varnish, to which is added a piece of pure white lead, as large as an English walnut, and about a spoonful each of japan gold size and turpentine. The leaf or bronze should be applied while the size holds a strongly tacky surface, but is just so dry that bronze will not show an uneven surface when applied. The bronze must always be put on the surface in large quantities, with a chamois-skin pad filled with cotton. If used too sparingly, the surface will present a clouded appearance that cannot be overcome or remedied.

**88. Size for Bronzes.**—The size for gold bronze should be the same as that used for gold leaf, but colored with lemon-chrome yellow. For copper bronze, use orange chrome, darkened with a little Indian red, which produces a color resembling somewhat the copper bronze.

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## GILDING

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### GILDING ON GLASS

**89. Gold Leaf.**—The gold leaf used for gilding on glass should be of the best quality. The gold beater usually prepares two grades of leaf; that used for this purpose is not beaten as thin as the ordinary leaf used on wood. The thin leaf breaks easily in the process of laying on glass, causing considerable annoyance and involving extra expense. It is therefore desirable that the leaf made especially for this purpose should be obtained direct from the manufacturer.

**90. Implements Necessary.**—To lay gold leaf on glass, several things are necessary: (1) the tip, a long-hair brush, capable of holding a full-sized leaf of gold; (2) the gilding brush, shown in Fig. 13, a soft camel's-hair brush, about  $1\frac{1}{2}$  inches wide; (3) a handful of soft, well-carded cotton batting for rubbing the gold. The tip will not pick up the leaf from the book unless first prepared to do so. This is done by drawing the tip across the head, at the same time pressing the hair of the tip down so as to allow some of the natural oil of the human hair to adhere to it. Gold leaf being extremely sensitive to the touch, the most trifling amount of adhesive is all that is necessary, as too much will give rise to serious trouble by causing the leaf to adhere to

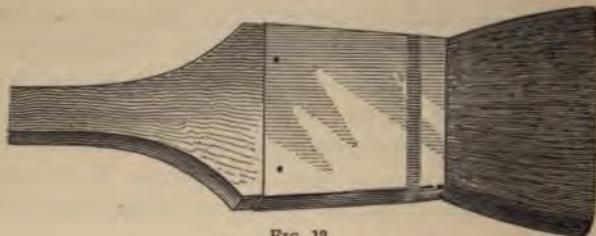


FIG. 13

the tip too persistently; or by the oil coming in contact with the surface of the glass and destroying the luster of the gold; or even by preventing the gold leaf from adhering to the glass at all. Gold leaf is very frail material to handle, and therefore great caution is necessary in its application.

**91. Method of Procedure.**—The design or lettering to be gilded is placed on the reverse side of the glass by means of a perforated pattern, through which whiting is pounced, thus showing the outline of the letters or parts to be gilded; or the design may be marked out with ordinary white chalk, the black grease crayon, or with the lithographer's black crayon pencil, which will readily leave a mark on a glass surface. The surface on which the gilding is to be done must be perfectly cleaned by removing every trace of oil or finger marks. The book of gold leaf is laid on a flat surface, with the opening toward the right. One leaf of the book is folded

**back** and creased with the left hand, thus exposing the gold. **The** cutting of the leaf is then accomplished with the little-finger nail of the right hand by running the nail along on the **gold**, using the folded book leaf for a guide. The piece of gold **so cut** is picked up with the tip (which is held in the hand during the cutting process) and laid on the glass lightly, the part to receive the gold having first been covered with a copious **coat** of the size, the preparation of which has already been described. The brush used in the size is usually a  $1\frac{1}{2}$ -inch **flat**, camel's-hair brush. All letters should be covered with a **liberal** supply of gold leaf, allowing it to overlap the **marking**. When the size under the gold is perfectly dry, the **surface** should be well rubbed with cotton batting, which will **remove** all scrap leaf that has not adhered or that has **overlapped**, and will expose to view any spaces or parts that have **not** been properly covered. The size is then coated all over the work, beginning at the bottom. It should be flowed on **quickly** and not applied a second time when once the water has penetrated the gold leaf, or the gold will be removed. After the washing, gold is laid on all spaces that have not been previously covered. When this is dry, a second rubbing with the cotton will remove the surplus. A third or fourth washing of size does no harm to the gold, and when diluted with warm water produces a brilliant, burnished effect.

**92. Sheet-Glass Signs.**—If gilding has been done on a sheet of glass to be used for a framed sign, the pattern must again be pounced with whiting over the gold leaf, which furnishes a guide, showing the place occupied by the letters. Two patterns should be made, as the one used in the gilding process becomes so wrinkled that it is useless for pouncing the letters. To prepare a paint to letter over gold leaf on a window that is exposed to frost (the great enemy of window gilding), a slow-drying varnish, colored well with lemon or orange chrome yellow, should be used, and when dry the gold leaf extending beyond the letters can be cleaned off easily with water, a little whiting, and cotton batting. For a backing, or lettering, color for framed glass signs, a quick-drying

varnish, or asphaltum black, can be used. As these signs are not exposed to the elements, almost any color can be used on them. A color is preferable, however, that is made the shade of the gold leaf, and that will not be seen when the sign is finished, should any small cracks or spots have been left in the gilding that would be considered too small to regild.

#### SPECIAL METHOD OF GILDING ON SHEET GLASS

**93. Chloride-of-Gold Process.**—To gild on glass by precipitation of chloride of gold is not only quite practicable, but will be found most economical, considering the comparative cost of chloride of gold and gold leaf. The following process is recommended: Into 25 quarts of water place about 24 grains of chloride of gold and filter the mixture through filter paper. (Pure chloride of gold should contain 84 per cent. of gold.) The mixture is then rendered alkaline by the addition of soda. To ascertain the proper amount, use litmus testing paper, procured at any drug store. Add soda until the red paper becomes blue by dipping it in the mixture.

A second solution is then prepared by saturating proof alcohol with marsh gas and then diluting it with its own volume of water. By combining the chloride-of-gold mixture with an equal quantity of the alcohol solution, the reaction that ensues results in the deposition of metallic gold and the neutralization of the hydrochloric acid by the soda.

**94. Preparation of Marsh Gas.**—For the preparation of marsh gas, two parts of crystallized sodium acetate, two parts of sodium hydrate, and three parts of powdered quicklime are thoroughly mixed together and heated, in a thin copper or iron flask, to a bright red. The lime is used to prevent the fusion of the mass. The gas is then readily evolved, and is conducted through a rubber tube connected with the iron or copper flask into the alcohol, until the latter is entirely saturated with the gas; this requires about 15 minutes. The gas forms readily an explosive mixture when

combined with air, and great care, therefore, should be taken in its preparation. In Fig. 14 is shown the method of generating and conducting marsh gas, and saturating alcohol with it.

**95. Application of the Gilding.**—Before gilding the surface of glass, it should be cleaned with whiting and water and thoroughly rinsed. Place the glass in a level tray that is slightly larger. Raise the glass on wooden points that will give a space of about  $\frac{1}{16}$  inch between it and the tray. Now combine the chloride of gold with the saturated

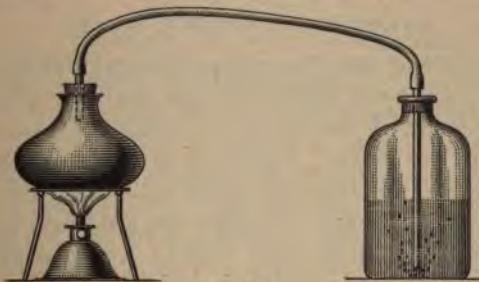


FIG. 14

alcohol. Apply immediately by flowing it into the space around the glass. After standing submerged for 2 or 3 hours, the gilding is firmly attached to the surface of the glass; the plate may then be removed and washed.

The chloride-of-gold solution does not deteriorate if kept standing, but the alcohol solution should be freshly prepared.

**96. Resistants.**—To prepare the tray used in the process of precipitation, coat a wooden board with shellac, and finally with asphaltum. Construct a dam around the edge of the board by melting together, over a slow fire,  $\frac{1}{2}$  pound of beeswax,  $\frac{1}{2}$  pound of rosin, and adding 3 fluid ounces of boiled linseed oil. Being in the nature of putty, this may be built up so as to retain the liquid.

If the gilding is to be confined to the letters, or to a design, asphaltum, reduced with coach varnish, should be used. This may be used to cut in around the letters or design, and to cover any part of the surface of the glass to be protected.

Two coats of asphaltum (one a day on two successive days) should be applied, and the work allowed to stand several days before gilding. After gilding, the gold may be backed with a gold color. A coat of beeswax on the glass will confine the gilding to a space on which letters are to be placed, thus protecting a large portion of the surface from the gold. After removing the beeswax, the letters may be penciled with asphaltum, and when dry the surplus gold may be neutralized and removed with water.

#### GILDING ON OPAQUE GLASS

**97. Utility of the Process.**—Ground and opaque glass render necessary some other means of applying gold lettering besides that used for the burnished gilding usually placed ~~or~~ the inside of clear glass. There are two methods that may be employed: one is to letter the glass with quick size (varnish oil, and chrome yellow), and apply the gold leaf when this is tacky; the other method uses gilding water, which is preferable because of the luster that may be given the gold leaf a luster that cannot be produced by the former method.

The gilding-water process is as follows: Make the gilding water as previously directed. After cleaning the glass, flow the gilding water over the surface copiously, and, before the water has flowed off, lay the gold leaf over the entire space to be lettered. As it is impossible to mark out a design and limit the gilding to it by this process, more gold leaf is required than when lettering glass by the regular process. After the water has entirely dried out of the gold, the latter may be rubbed down with cotton batting. If any holes or cracks appear in the work, flow on some more gilding water and cover the defects with gold leaf. When the water has again dried out of the gold, rub down and proceed with the lettering. Asphaltum should be used for this purpose; it dries immediately, and permits the work to be followed up closely. When the lettering is complete, use cotton dampened in water, and rub off all the gold left exposed outside the letters. The asphaltum may then be removed with

turpentine and cotton. When this is dry, varnish the letters, and allow the work to dry for 24 hours. The glass may then be cleaned with soap and water and the letters shaded and high-lighted. By this process, many beautiful effects may be worked out on China or fancy glassware, on barber's shaving mugs, and on many household ornaments that are not subject to frequent washing in boiling water. Such articles as are used for domestic purposes should be treated with a gold specially prepared for China painting, and this should afterwards be fixed permanently by firing.

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#### GILDING ON WOOD OR METAL

**98. Application of Gold Leaf.**—Having considered the use of the tip, and the handling of gold leaf for gilding on glass, its application to a wood or metal surface may now be considered. The manner in which the gold is laid on these materials differs. The slow size will allow the whole sign to be covered with gold leaf, before rubbing down to a burnished surface; and, if the letters are large enough to take the whole leaf without much waste, the letters can be gilded from the book without the use of the tip, by turning the leaf back and placing the book face downwards on the size, rolling the leaf on gradually, so as not to break it. When the sign is entirely covered, a 2-inch bear's-hair brush is used to remove the surplus, and the whole gilded surface is well rubbed. This will take the superfluous scrap, carrying it along the letters, filling in all cracks or small spots that may have been overlooked, which, if not too large, will not show when the gold is burnished. After rubbing with the brush, a handful of cotton batting should be used, and the gold rubbed with this until no laps or spots are seen.

**99. Gilding on Quick Size.**—To gild on quick size, gild the first two letters rapidly, rubbing down the first letter only; then proceed immediately to gild the third, afterwards rubbing down the second; and so on until the sign is gilded. The reason for doing this is that, if the gold were allowed to remain too long on quick size before burnishing, it would

have a wrinkled appearance, caused by the action of the size in drawing the gold, while drying, which is prevented when the surface is covered evenly with gold and burnished in time. Aluminum leaf, which is considerably tougher than gold leaf, can be applied on several letters before burnishing.

**100. Outside Gilding.**—For outside gilding, or gilding in places where the wind is strong enough to prevent both the use of the tip and the process of gilding from the book, another method is followed. This is accomplished by cutting wax paper into sheets large enough to leave a margin of  $\frac{1}{2}$  inch beyond the edge of the gold leaf, which adheres to the wax paper when the latter is pressed over it evenly. The waxed paper with the gold leaf is then placed in an empty book, ready for use. The size being more tacky than the surface of the wax paper, the leaf of gold will leave the paper and adhere to the size when pressed with the hand. After the letters have been entirely covered, they should be rubbed down as described, using the bear's-hair rubbing brush and cotton batting, as in other gilding.

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#### PEARL FILLING AND ETRUSCAN GILDING

**101. Pearl Filling.**—The pearl filling often seen in the most elaborate window lettering is not in such general use today as in former years, as it has been supplanted somewhat by the Etruscan gilding, which consists of a dull or chased filling within an outline of bright gold. The material used for pearl filling should be of the best quality mother of pearl in perfectly flat and thin pieces, and must be applied after the letters are gilded, shaded, and otherwise finished. The open strokes of the letters are coated with a light-colored coach varnish (to which a few drops of japan gold size have been added), overlapping the edges of the strokes, but without covering the shade, especially if the shade is of semi-transparent colors. The varnish is then allowed to stand a few moments, until it will take the pearl without danger of slipping. The pieces are then fitted to fill the space within the letters, as nearly as possible. After one letter is covered,

and before beginning on another, well-crumpled tin-foil is taken and covered over the entire back of the letters, and is pressed in well with the fingers, so as to force the foil in contact with the varnished surface of the glass. Do not finish more than one or two letters at a time, unless the drying quality of the varnish is positively known. The tin-foil filling gives the appearance of a solid pearl letter.

**102. Etruscan Gilding.**—The Etruscan gilding produces a chased-gold or silver effect, and is accomplished by a simpler method than that just described. There have been many kinds of size suggested for this purpose, but the one producing the best results is sour or stale beer, although either glucose water that has been allowed to stand some time, or ordinary gilding water to which a few drops of turpentine have been added, may be used, although not with as satisfactory results as with the former. The beer size is applied in the same manner as regular gilding water, but the gilding must not be rubbed with cotton. To cover all places that may have been left in the first gilding, the part already gilded is given a second application of the beer size after the first has thoroughly dried; any open spaces are then gilded over. When dry, without rubbing the gold, this should be painted over with a varnish color, of about the same shade as the gold.

This form of treatment gives an extremely rich effect when combined with burnished gold. There are many ways of ornamenting the inside, or the face, of letters, and giving them a very attractive appearance. Leaves, vines, disks, rosettes, cross-lining, and striping are usually employed, covering the lower half of the letter and leaving the upper part plain, save, perhaps, for a fine line carried parallel with the heavy outline of the letter.

In Fig. 15 are given some of the most common forms of letter-face treatment used in combination with Etruscan gilding. The design in such cases is made of bright or burnished gold, and the field of the letter backed with the dull gold. Fig. 15 (a) shows a letter in which a basket pattern

is employed for the lower portion of the letter; Fig. 15 (b) shows a form of mural treatment; and Fig. 15 (c) shows a letter broken with an ornamental center, the lower half of which is ornamented with oblique stripes.

**103. Finishing Coat.**—All lettering on glass should be well covered with a varnish color as a finishing coat, to protect it both from frost and from the wear incidental to

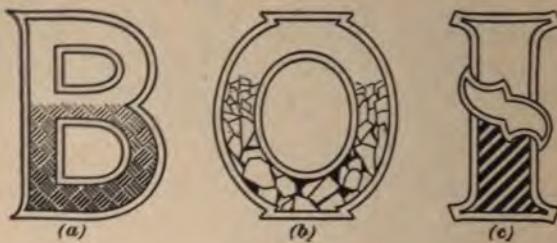


FIG. 15

cleaning the glass. It is impossible to prevent lettering on glass from eventually peeling off, especially when certain conditions obtain; but with extra caution, window-glass lettering may be made to stand for years. A coat of the best coach varnish, overlapping the edges of the letters about  $\frac{1}{8}$  inch on the clear glass, will prevent frost from penetrating underneath the edge of the letters, and thus hastening their tendency to peel.

#### GLASS SIGNS

**104. Points in the Preparation of the Design.**—The sign painter usually secures large contracts for glass signs by preparing a sample according to specification furnished by the customer, who prescribes certain limitations in regard to price. In the sample, therefore, lies the opportunity to produce a design that combines the most artistic effect with the least amount of handwork, or that will require but a small amount of gold leaf, so as to reduce to a minimum the cost of material. Many sign painters, in their eagerness to excel in a competitive design, often succeed in securing the work, only to find that they have undertaken

more work than the price warrants, and that therefore but a slight profit on the work can be realized. To guard against this, the following suggestions may be profitable.

**105. Bronze Backgrounds.**—It is not intended to depreciate elaborately gilded and expensively framed designs. Designs of this kind may always be prepared when restrictions in regard to price are not so closely considered. It is intended only to afford such suggestions as will be profitable to the student in the advertising-sign department of a sign-painting establishment.

There is no background used in hand-painted glass signs that will give so rich an effect as the bronze background. To accomplish this, letter the design in black or in colors; when dry, varnish the entire back of the glass with a thin coat of light-colored varnish. When this is almost dry, that is, when it is but slightly tacky, bronze the entire surface, and then dust off all bronze that does not adhere to the varnish. Next take wallpaper of some artistic floral design (large designs being preferable) and place at the back of the transparent bronze surface; the result will be a floral design that apparently is worked out in bronze with indistinct colors.

**106. Backgrounds of Various Kinds.**—Another inexpensive background is made by lettering the sign with a plain black letter, and then gilding the edge of the glass with a margin of bright gold from 1 to 2 inches wide, according to the size of the sign. Varnish the entire back of the glass, and while the varnish is wet cover it with gold flitters or metal brocades. These make a rich and artistic glass sign. If silver flitters or brocades are used, the edge should first be silvered with burnished silver to harmonize with the silver flitters.

A black ground with tin-foil lettering constitutes the cheapest glass sign that can be produced. It is made as follows: Make an exact pattern of the lettering or inscription desired, and lay the glass over it. Then cut in the letters by painting a black background around them. When

the black is dry, the letters may be glazed with crimson lake, Prussian blue, verdigris, or gamboge, mixed in varnish, after which the letters are coated with varnish and crumpled tin-foil is laid over them.

**107. Elaborate Glass Signs.**—In the preparation of the more elaborate glass sign, every means is employed that will add richness to it, either through coloring or in the design. Aside from gold and silver, the embellishment of the design depends on the selection of colors that will contrast or harmonize, and make it evident that the whole is the work of a master. To this end ribbons, panels, floral pieces, trade marks, emblems, landscapes, etc. are used. It is a difficult matter to paint floral pieces or landscapes directly on the back of the glass, so that they will appear artistic from the face. The sign painter usually paints such designs on lithographer's transfer paper, applying them, when dry, to the back of the glass sign by varnishing both the picture and the surface of the glass on which it is to be placed. Then, when the varnish is quite tacky, it may be transferred by firmly pressing it against the glass. The transfer paper is afterwards soaked off with water, leaving the paint only on the surface of the glass.

All blending on ribbons and panels should be done after the color next adjoining them has been applied and is thoroughly dry. The last thing to be applied is the pearl filling of letters, or the Etruscan gilding (both of which are described in preceding articles). The sign completed, the next important point to consider is the frame.

**108. Their Frames.**—Before making a selection of the frame, the design and coloring should be studied, and a frame chosen that will suit these as well as the dimensions of the sign. Many sign painters keep specimens of frames or frame moldings on hand, and can find by actual experiment the style of frame best suited to the character and coloring of the work.

Special designs in frames, on the architectural order, are used for certain styles of glass signs, and these are, perhaps,

the most artistic kinds of framing that can be used. In Fig. 16 is shown a design that illustrates this style of frame.

The flat, oak frame for advertising glass signs has no equal for simplicity. It is also inexpensive, and, in light or



FIG. 16

**dark** wood, harmonizes with almost any style of coloring or design. Gold, as well as black-walnut, moldings are almost obsolete for glass sign framing, but white and gold, and white and silver, moldings are good styles to use for various kinds of signs.

## ETCHING

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### ETCHING ON BRASS PLATES

**109. Importance of Etching.**—A greater amount of caution is required in etching than in any other branch of sign painting. Not only are the materials expensive and mistakes costly, but the chemicals with which the work is done are dangerous, and any improper use of them would be likely to impair the health or even destroy the eyes of the operator. Etching on brass includes not only the preparation of the plate, but the etching and finishing of it. The best grade of engraving brass is required for this process, and U. S. standard gauge No. 16 is the thickness in most frequent use. This is  $1\frac{1}{8}$  inch thick. The plate must be well buffed before lettering. The buffing is usually done by a brass or metal finisher, and brings the metal to an extremely high polish with felt buffers and polishing powders. The design should be made on medium-thick Manila pattern paper, and transferred to the brass plate by means of carbon transfer paper, placing the carbon paper between the sign surface and the pattern and tracing the outline of the letters and design with a stylus. If the design is a large one, the back of the pattern may be rubbed over with a mixture of whiting and benzine. When tracing is done, a white line will appear on the brass. After the design is transferred to the plate, it is ready to be cut in, preparatory to the etching process.

**110. Material Used for Resisting Acid.**—Asphaltum is used to protect the plate while in the acid bath; it must be applied with an even, solid surface, and not thinned more than is absolutely necessary. Use only the best quality of asphaltum, and thin with equal parts of coach maker's japan and coach finishing varnish. The letters and other designs are cut in with this color, leaving the lettering and stripes clear. The entire sign, exclusive of letters, is then covered evenly to the edge with the asphaltum, and allowed to dry 24 hours, at least. The marks made by the tracing should

then be removed with water. A new cotton cloth is used to rub the entire surface, which is done to destroy the glossy surface of the first coat, in order that the second may be seen, after which a second coat of the asphaltum is applied with care, to keep as close to the edge of the first one as possible. The second coat is allowed to stand 48 hours, after which the sign is ready for the etching bath.

A coating of beeswax also can be used as a resistant, and is applied to the brass, silver, or white-metal plate when hot. When this material is used, the design is traced through it on the surface of the metal by means of a stylus. The wax is used only when a line etching is desired, and is therefore more especially adapted to work on which the letters are very small.

**111. Etching.**—Etching should be done in a room exclusively set apart for this purpose, as the fumes and gases given off during the process are extremely unwholesome, and, in fact, very poisonous, and should never be inhaled. The sign to be etched is laid on a table, the top of which has been rendered perfectly level, and over which is suspended a funnel-shaped hood, to collect the fumes and carry them off to the outside air or to a chimney flue. This arrangement is shown in Fig. 17, where *b* is the etching table under the hood *a*. At *c* is shown the shutter, which, when open, permits the noxious vapors to escape up the flue in which it is placed.

**112. Beeswax Dam.**—The sign is now prepared by banking up the four edges with beeswax, so as to give the

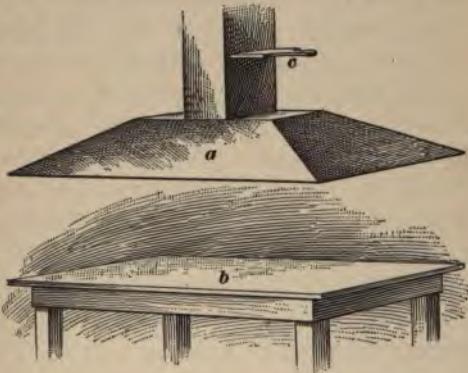


FIG. 17

sign the form of a shallow tray. If the part to be etched is in the center of the plate, the dam may surround this, instead of being placed at the extreme edge of the plate; this would effect a saving of acid. The beeswax is prepared by melting together over a slow fire  $\frac{1}{2}$  pound of beeswax and  $\frac{1}{2}$  pound of rosin, and adding about 3 fluid ounces of boiled oil. When thoroughly melted, this mixture is poured into a vessel of cold water, and is then ready for use. Should the mixture become too hard, by standing, to work easily (it should be about the consistency of putty), it may be remelted and a little more oil added.

**113. Application of Nitric Acid.**—Within the rim of wax, a mixture of one part of nitric acid to two parts of water is now poured to a depth of about  $\frac{1}{4}$  inch. The liquid will immediately begin to effervesce, and strong pungent fumes of a yellowish color will rise from the surface. The hood should now be adjusted to receive and carry off these fumes, and the action of the acid should be permitted to continue until the letters are eaten into the plate from  $\frac{1}{2}$  to  $\frac{1}{4}$  inch, according to the depth desired. The depth of the letters may be determined by feeling their edges with a pointed tool of any kind, though care must be exercised not to scratch the asphalt surface. The use of a pair of rubber gloves will obviate the discoloring or burning of the fingers with the acid.

Should the action of the liquid, for any reason, be too slow, it may be hastened by pouring a small quantity of the pure acid on the surface of the plate, and stirring it around carefully with a whisk broom; if too strong, the acid may be diluted with water. Strong acid has a tendency to undercut the letters and destroy the sharpness of their edges. The etching, therefore, should not be done too quickly; it should take 3 or 4 hours for the acid to eat the brass to a proper depth.

**114. Cleaning the Plate.**—After the etching is complete, the plate is removed from the table, the acid poured off by breaking a small piece of the wax dam from the end, and the whole plate thoroughly washed in cold water. The

**bath** tray, previously prepared, is usually built of wood; it should be large enough to receive the entire plate, and deep enough to hold 3 or 4 inches of water. The wax is then removed from the edges and saved for future use, and the asphalt coating wiped off after it has been thoroughly softened with turpentine. Should there be any slight imperfections in the surface of the plate, due to the action of the acid through an exposed place in the asphaltum, they can easily be removed (if they are not more than surface marks) on an ordinary buffing machine.

**115. Filling.**—The etched letters are usually filled with **black** japan, which is afterwards baked until it has a vitreous appearance. The etched letters are sometimes filled by the **letterer** with gutta percha or a black made with patent drier, though the results are not so good as with the other material. **Gutta-percha filling** is made and applied as follows: Take **equal** parts gutta percha and asphaltum, and melt together in an iron pot, with about one-quarter their bulk of finely powdered gum shellac; the mixture is penciled into the **letters** while it is still hot. Should a red or blue filling be required, the asphaltum can be replaced with vermillion or **cobalt** blue, according to the one required.

Should a sign painter desire to enamel and bake the lettering, he may do so by providing himself with an enameling oven, or he may turn the work over to a japanner. There are a number of firms that not only sell ovens for enameling, but also manufacture enamels in black and colors. Enamels should be heated to from 200° F. to 300° F.; colors should not be heated beyond 250° F.; black may be heated to 300° F.

A patent drier may also be used for a filling. This material is sold in original packages, from  $\frac{1}{4}$  pound up, and is mixed with lampblack until it is of the consistency of thick putty. The letters are filled with this paste by shaping a piece of pine wood into the form of a putty knife and running the paste into the letters, the operator being careful to work the wooden knife in one direction only. The grain of the metal shows in the buffing, and it is well to follow the

grain. This is very important, for otherwise small scratch ~~—~~s are likely to show prominently. After the filling has been completed, the paste remaining on the surface should ~~—~~be removed with a woolen rag and alcohol. Dry lampblack should then be thoroughly rubbed into the faces of ~~t~~he letters, after which the signs may be allowed to dry ~~—~~

**116. Polishing Metal Plates.**—Brass or metal plates are polished with *Pultz* paste, or with a liquid preparation mixed as follows: To 1 pint of water add 1 paper of tripoli (rottenstone) and 1 ounce of oxalic acid. Metal plates should be cleaned every day, in order to keep them in good condition. By so doing, the work of cleaning brass plates ~~—~~is rendered comparatively easy; while if they are neglected ~~—~~for several days, they become so tarnished that it requires considerable effort to restore them to a good condition.

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#### ETCHING ON ALUMINUM

**117. Acid Used.**—Nitric acid, although most powerful and effectual in attacking white metal, brass, iron, etc., is powerless to affect aluminum. The acid that must be used on aluminum is *muriatic acid*. This may be used clear or diluted with one part water to two parts of acid. *Caustic potash* also is used, but for all lettering purposes the acid is preferred. Asphaltum is used as a resistant, and, as in brass etching, two coats of it should be given, so that the acid will not eat through where the asphaltum is thinly applied, and also to prevent the edges from becoming broken and uneven. Acid may be used clear if the asphaltum coating has stood long enough to become dry and hard so that the acid cannot affect the edge of the lettering by getting under the asphaltum.

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#### TRIMMINGS FOR METAL SIGNS

**118. Moldings, Castings, Etc.**—Brass or white metal signs are placed in position by using large fancy-headed screws, screw buttons, rosettes, etc. Raised-metal border

also are extensively used. Special relief designs are often attached to metal plates, and give, in connection with embossed letters, a finished artistic appearance. Whatever is added to the face of a metal plate must be added with a view to the constant cleaning of the plate when placed in position. The entire surface must be exposed, so that it may be readily cleaned. Therefore the raised borders are beveled toward the face of the plate, and should never exceed  $\frac{1}{8}$  inch in projection. The width of borders ranges from 1 inch to  $2\frac{1}{2}$  inches. When wide borders are used, they may be chased, if the body of the plate is highly burnished. Sometimes the border is burnished, while the plate is given a dull or chased effect. This is done by flowing nitric acid over the plate after the letters have been etched, allowing it to remain on the surface only long enough to remove the burnish from the plate.

**119. Bas-Relief Designs.**—By molding the design in wax or plastiline and taking a plaster cast of it, the design may be cast in brass; or it may first be carved in wood. After the casting is made, it should be finished by filing and burnishing until all roughness is removed; then it may be gold plated. It is gold plated to prevent it from tarnishing, as designs with an irregular surface cannot be cleaned without dirt being collected in the parts that are depressed. When plated, the design requires but little cleaning; this is usually done with some cleaning powder before the body of the sign is cleaned. These designs are fastened to the plate by means of holes drilled through the plate and into the design, as described later. If such a design is to be attached to the surface of a convex or concave sign, it must be cast on the same arc as the finished sign. All trimmings, such as brass tubing and pressed-brass ornaments, that cannot be fastened on from the back may be brazed on the surface; in many cases they are screwed on with small, round-headed brass screws.

**120. Metal-Sign Frames.**—When practicable, brass signs are mounted on wooden frames, the frames being

placed in position before the brass work is attached. Drum signs, however, may be finished before they are put up. They are usually placed on such a frame as that shown in Fig. 18. This frame should be fitted against the column or

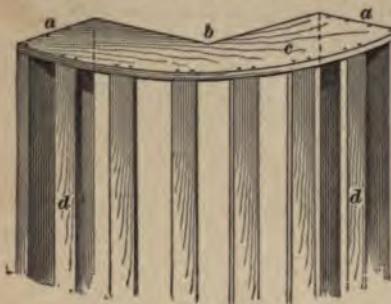


FIG. 18

corner of the building (unless the latter is rectangular) before the sign is attached. To find the exact angle or arc, a piece of cardboard may be used and accurately fitted, cutting it in the form of the part *c*. The top and bottom of the frame, being precisely alike, should be

made solid; so with both side pieces *a*, *a*. Strips are fastened, as shown, between top and bottom, to serve as a support for the plate and insure it against denting, which otherwise would be the result if it were struck with a heavy object.

#### ETCHING ON GLASS

**121. Hydrofluoric Acid.**—The preliminary details and arrangements for embossing on glass are precisely the same as those described for etching on brass, with the exception of the acid. **Hydrofluoric acid** is an intensely corrosive compound that will dissolve every glassy or vitreous substance with which it comes in contact. It is usually put up in ceresine bottles, and can be purchased only in the original packages, in quantities from  $\frac{1}{4}$  pound up. For use, the acid is diluted in the proportion of two parts of acid to three parts of water, though if this proves too weak, the proportion of acid may be increased. If the etching fluid is too strong, the edges of the letter will be undercut and the plate destroyed. The object of glass embossing in lettering is to secure a richness of effect by contrast. This is accomplished by gilding the etched lettering and edging it with bright gold. The gilding on the etched center of the lettering is

mottled, and shows the depth of the etching, presenting a decidedly rich effect, especially when designs are executed with the pencil brush within the outlines of the letters.

**122. Testing the Acid.**—To know when the sign is etched to a proper depth, some sharp-pointed instrument should be used. It must be used with great care, however, as a slight scratch on the edge of a letter, or on the surface of the asphaltum, would show the effect of the acid after the sign is finished. It is not necessary that etching on glass should be of greater depth than the minimum necessary to show the edge of the letter and secure the mottled effect. This acid is removed in the same manner as the nitric acid, and the asphaltum dissolved with turpentine, after which the plate is well cleaned with whiting and water; then it is ready for the finishing process, the gilding or coloring.

It is always desirable that the best results be obtained; and, to insure this, the time should not be considered lost that is spent in testing the strength of the acid on various glass surfaces. Plate glass offers less resistance to the acid than sheet, or crown, glass. The acid is influenced, therefore, by the metallic oxide contained in the glass.

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#### CAST-METAL SIGNS

**123. Material, Construction, Etc.**—Cast-metal signs are the most expensive signs produced by a sign painter. They are also the most substantial and artistic signs that may be used for certain purposes, such as architectural and memorial tablets, monumental plates, and mercantile signs. Designs are often suggested in high relief on the background of such signs, or they may be brought out in bas-relief in connection with the lettering. The cycas-palm branch, on account of its symbolical significance, is often used, in connection with memorial tablets, as an emblem of victory, joy, or merit. These signs are cast in **statuary bronze**, which is a fine quality of bronze. The face of the letters, as well as the border, of a sign should be highly polished, which not only shows the quality of the metal, but greatly adds to

the richness of the whole sign. Care should be taken that the work of casting the metal sign is entrusted to a reliable brass foundry, as few brass founders are capable of producing satisfactory work in statuary bronze—work that is entirely free from sand holes or specks.

Light-faced antique, or first-century Roman, letters, such



FIG. 19

as are shown in Fig. 19, are the best styles of letters to use on this kind of sign, although a light-faced Egyptian, as shown in Fig. 20, is often used.



FIG. 20

The patterns for these signs are made of wood, and all strokes of letters are beveled slightly from base to surface, in order that the casting may be perfectly done. In making a pattern from a design furnished on pattern paper or blueprint, the patternmaker prepares strips, cut to size, of vertical and horizontal strokes, and glues these in place, completing all joints and spurs with white-lead putty, and forming by hand all curves and freehand designs.

**SHADING LETTERS WITH COLORS****COLORS USED**

**124. Combinations in Shading.**—There is a great variety of methods by which shading may be added to a letter by the use of colors. A law exists in nature that is very forcibly shown when combining colors in shading, and this law must be regarded, or the work will not produce satisfactory results. A color that, when being mixed, appears to be of a suitable shade will appear, if placed on a black ground, many shades lighter; and the reverse likewise is true. If the same color is placed on a white ground, it will appear many shades darker. Letter shading may include several shades of one color; or several distinct colors may be used together, either blended or separated by their outlines.

**125. Transparent shading** is of service to the letterer, in that it both saves time and gives most satisfactory results. A transparent-shading mixture is made by stirring a few drops of well-ground black in a medium-drying varnish, adding a few drops of turpentine. This mixture forms a shade for all light colors and tints, and, if properly applied, produces what is known as the **natural shade**, or the same strength and shade that would be cast from a projected object on the same ground.

**126. Glaze Shading.**—Transparent shading is used, in the form of a **glaze shading**, on such colors as vermillion, green, blue, yellow, etc., by adding to a medium varnish a color corresponding to that with which it is combined. For example, the glaze shading applied on vermillion should be mixed with carmine (in tube). For green or blue, Prussian or some other strong blue is used; and sienna on yellow, etc. The glaze shading is always placed on another shading when the latter is thoroughly dry, and covers the half of this nearest the letter, as shown at *c* and *e* in Fig. 21.

**127. Double shading** is illustrated also in Fig. 21, in which *a* shows the black line used to divide the shadings; *b* shows the block, usually some bright color, as vermillion, blue, etc., on which the glaze shading *c* is placed; *d* and *e* represent some neutral color, as gray, brown, etc., of which *e* is the transparent shade; while *f* is the natural shading on the ground color, made with the same as *e*, but giving an entirely different shading.

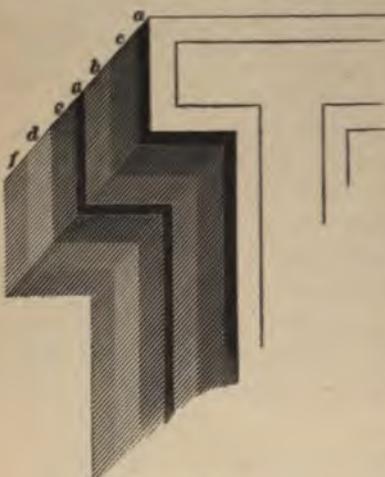


FIG. 21

in both cases. The natural color of the gold is warm, and harmonizes, therefore, with almost every color; while the silver is cold in tone, and colors suitable to it must, therefore, be selected. Five colors are usually blended, when vermillion is used for the spectrum shade, as follows: (1) cream; (2) lemon yellow; (3) orange; (4) vermillion; (5) carmine. In all other cases, four shades of one color are used. In Fig. 22 is shown the proper position the four shadings should occupy. It will be observed that the darkest shading 4 comes against 1 the lightest, which is usually a tint of the color, while 2 and 3 are equally divided in strength between these extremes. The shadings always

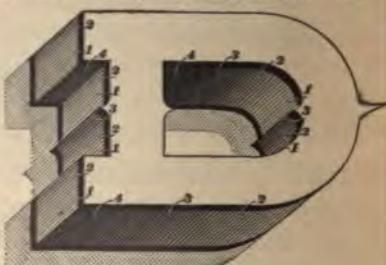


FIG. 22

occupy the relative positions shown, except on letters having a horizontal stroke, in which case but two colors, 3 and 4, are used underneath these strokes.

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#### BLOCKING WITH GOLD

**129. Gilding and Shading.**—Gold blocking is a form of shading in which gold leaf is used instead of paint, as described in *Elements of Lettering*. When gold leaf is used for this purpose, it is invariably applied in connection with a black or maroon letter. The block shading should be applied before the lettering is done; this requires that letters should be marked out with absolute accuracy. For this reason many letterers use some quick-drying mixture and letter the sign before the gilding is done, lettering it finely with a varnish black. This trims up the work by covering all irregular edges left in the gilding. Asphaltum is used for shading on the gold. This may be reduced with varnish until it becomes transparent. Several shades, which may be blended, are used on rounded letters, while but one strong shade is used on square block letters. The asphaltum shade is placed underneath all horizontal strokes, leaving the side shade, representing the block, of gold leaf. Quick size is used for gold blocking, and this should be thoroughly dry before asphaltum coating is applied.

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#### THE PREPARATION OF COLORS

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#### APPLICATION TO VARIOUS MATERIALS

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**130. Proper Use of Mixtures.**—Much rapidity in lettering is gained by a knowledge of the color, or combination of colors, that can be used to the best advantage on a particular material. Suppose, for example, a design is to be executed on an elaborate silk banner; unless the proper mixture is used, the oil or other medium will be absorbed by the silk and will so spread as to ruin the material at once. This condition may arise in the applications of colors to

many materials, where a successful design will depend on the kind of mixture used.

**131. Lettering on Cotton Sheetings (Wet Process).** Cotton sheeting may be wetted before being lettered, and the lettering applied while the sheeting is quite damp. Or it may be lettered by the dry process described in *Sign and Banner Making*. Color for the former method may be mixed with equal parts of boiled oil and japan, and thinned with turpentine. A 1-inch flat varnish brush will be found convenient for spreading the color on the cloth with great rapidity, if the letters are large; for small letters, the camel's-hair swan quill is used. Shading colors, thinned well with turpentine, can, without danger of spreading, be applied when the cloth is almost dry.

**132. Cardboard and Enamel Cloth.**—Cardboard must always be lettered with water color or card black. Enamel cloth also will take this latter color, and it will be found to be the only color that can be used on this material with absolute certainty that it will not creep.

**133. Silk and Satin.**—On silk or satin, different preparations must be used under different circumstances; for instance, if the design is in the form of a large panel on which a picture is to be painted, a paint must be used that will leave the material pliable. An outline of hard-dry ing color may be used, and the center of the design filled in with any oil color to which has been added melted beeswax to the amount of one-fifth of the color. Ordinary orange shellac is used for a lettering preparation, and will be found a very reliable one. The shellac is used clear, but not too thin; when too thick to flow easily from the brush, it may be diluted with alcohol. Lettering on silk must have two or three coats of this, according to the grain of the material, before it is ready to size for gilding, otherwise the size will not bear out, and the gold will appear mottled. Another preparation for the same purpose is the clear asphaltum, which should be thinned out with gold size, japan, and a few drops of turpentine; this will be found much better to use on close-grained

silk than the shellac. All shading colors used on silk or satin should be mixed with naphtha to prevent them from spreading.

**134. Black-Surface Cardboard.**—The white used for lettering on **black-surface cardboard** should be a water color, which can be mixed by filling a tumbler two-thirds full of English or French flake white, adding enough water to dissolve it, and, when well mixed, about a tablespoonful of mucilage. This should be well stirred and allowed to stand a day or so before using, then thinned to flowing consistency and kept in an air-tight jar. Letterine or mark-a-line white, ready-prepared white put up in 2-ounce bottles, is the most reliable water-color white on the market. These may be obtained of the Technical Supply Company, Scranton, Pennsylvania, at a cost of 25 cents per bottle. Either Florentine white or Kremnitz white (unsized) will be found to be an excellent white to use in large quantities for opaque lettering. By adding dry colors to the white, a great variety of tints is produced, but these must be mixed with a little mucilage to set the color and prevent it from rubbing when dry.

**135. Glass.**—For glass, the color used mostly is black, especially for outlining, shading, and lettering. To mix this color, use dry lampblack, best quality, grind thoroughly with a palette knife, and add only best coach varnish. Thin with equal parts of coach varnish and turpentine. Dry colors mixed with water and glue are used for temporary lettering on window glass. Many beautiful effects are produced by their use, as they flow freely and dry quickly.

**136. Brick or Stone Panels.**—For lettering on brick or stone panels, the white lead should be mixed with nothing but boiled oil. The black used is lampblack of an inferior grade, as for this purpose it will answer as well as the best quality. Mix the lampblack with boiled oil, and add a cupful of japan to a gallon of color.

**137. Plastered Surfaces.**—For lettering on plastered surfaces, a light flowing color, such as the card black, may

be used; it will cover the surface and will not spread or run. If colors are desired, mix them thick with coach varnish, and thin freely with turpentine. These colors will dry flat (or without a gloss). If oil colors were used on this surface, the oil would flow from the color into the white plaster and show a yellow line surrounding the letter. The nature of the mediums, as regards their drying qualities and the application of colors, is therefore a constant study with the sign painter, and requires much careful consideration.

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### RELIEF LETTERS

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#### WOOD, METAL, AND GLASS

**138. Wooden Letters.**—Relief letters are those that are raised above the surface of the sign; usually they are made of wood, unless the sign plate itself is of metal, in which case the letters are of brass cast from wooden patterns. The manufacture of wooden letters is such a simple matter that many sign painters undertake the whole process. The outline of the letter is drawn with coach black on thin Manila paper, which is glued on the surface of the wood and then sawed out; only the best kiln-dried pine planking should be used. The edges may then be beveled or rounded, as desired. If the latter, the only tools necessary are a chisel and a rasp, after which they should be finished by using very coarse sandpaper, followed by fine sandpaper.

**139. Large Roof Letters.**—The large wooden letters used on the roofs of buildings or on other elevated places are made and put up so as to stand out in relief against the sky, and consequently they must be much larger than they appear from the ground. These letters, although reaching in some cases a height of 8 or 10 feet, are simply constructed and easily put in place. They are usually made of 1½-inch or 1¾-inch lumber, which must be well seasoned, and each stroke of the letter mortised and tenoned to give strength, as shown in the letter in Fig. 23. At least two angle irons should be used at the bottom of each letter, of

sufficient length to raise the letter from the roof; and there should be two round braces behind; the size of the latter would vary with the size of the letter. A  $\frac{1}{4}$ -inch rod, extending along the tops of all the letters, is fastened on by means of staples; it protects all single-stroke letters, such as I, J, L, and gives the whole sign sufficient strength and stiffness to withstand a violent wind storm. These letters, in order to show to the best advantage, should always be painted black, and the irons, lead color.

**140. Metal Letters.**—The metal letters usually fastened

on the brass or white-metal sign plates are cast from wooden patterns, as before stated, and are afterwards filed, buffed, and plated with gold or nickel, to protect them from the weather. They are fastened on the plates with screws, holes for which are drilled in the center of the letter and through the sign plate. To locate the points for the holes, the letters are carefully placed on the plate where desired, and whiting is dusted around the edges, thus outlining each letter. Two holes are drilled through the plate in the center of the space covered by the letter, after which the letter is again placed on the plate, to locate exactly the space where holes are to be drilled in the letter. The letters are then drilled, tapped, and screwed on from the back of plate.

**141. Compo Signs.**—Compo signs, the letters of which are also in relief, are molded signs made by pressing a wooden-pattern design into a compost, or composition, which may be either the material used for stucco work (a sized plaster) or the compo used in the manufacture of picture-frame moldings. These signs, when colored, can be made very attractive, especially for advertising purposes.

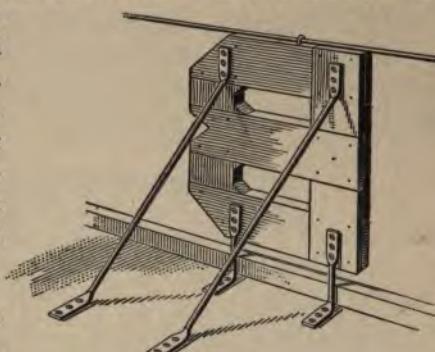


FIG. 23

**142. Wire Signs.**—**Wire signs** may be of an artistic design, the character of which will depend entirely on the shape of the framework. Ribbons and panels can be fastened back to back on wirework; such a sign will not catch the wind, and may be made to read from two opposite directions.

**143. Gas-Pipe Frame Signs.**—The gas-pipe frame signs, generally used in London, England, are easily constructed, and for advertising purposes are valuable, as they can be read several miles away. The size of this style of



FIG. 24

sign is limited only by the amount of roof surface to which the braces or wires can be fastened. The frame may be the extreme width of the building, as the wires or braces are fastened in two opposite directions only. The letters are of wood, and are hung between the sections of the frame, as shown in Fig. 24. This sketch shows a sign 45 feet in width by 36 feet in height (the average length of the gas pipe is 15 feet), made to read from one direction only. A wire brace extends from every intersection of gas pipe to a staple in the roof or wall.

**144. Advertising signs on brick walls** sometimes reach immense proportions. It is not unusual to see the

sign painter begin his design at any part of the work, as the panel may be a hundred feet or more in length or height. Such work is executed, therefore, from a miniature design or scale, which in this case could be either  $\frac{1}{8}$  inch or  $\frac{1}{4}$  inch to the foot; and to insure against mistakes it is divided into blocks 10 feet square, and lined off on the sketch with red ink. Two or three plumb-lines dropped from the roof of the building from points 10 feet apart, with tapes tied around them at every 10 feet of their length, will locate each square on the building, and work can be carried out with as much certainty, at any part of the design, as though the whole sign were but 10 feet square.

These designs are often prepared so as to project beyond the top of the building, in which case the projecting parts of the design are cut out of wood and securely fastened by braces. This kind of relief sign, standing out against the sky, can be made very attractive.

**145. Transparent and Illuminated Signs.**—Electric lighting has done much to develop this branch of sign painting, and signs that otherwise would be unseen after dark can be so arranged as to serve the twofold purpose of advertising and illuminating. The materials usually employed for transparent signs are common sheeting, white Holland shade cloth, and frosted and stained glass. Many beautiful designs are made of the stained glass, framed in sheet metal surrounded with scrolled ironwork. Letters cut out of wood or metal are used for electric relief signs.

**146. Unlimited Glass Signs.**—It is not an uncommon thing in Europe to see the name of some periodical, or of a business firm, stretched obliquely across a three- or four-story building, covering almost the entire front and reaching from the lower left corner above the store front to the roof. This style of sign is usually constructed of the heavy-line script letter, and is made of any rough lumber, of uniform thickness, sawed to the design required. The whole design is firmly secured together, and opal glass is cut to cover the face, after first coating the wood with white lead.

The separate pieces of opal glass are carefully fitted, ~~so~~ as not to leave too wide openings where joined, nor to ~~project~~ beyond the edge. The sign is then covered along the ~~edge~~ with zinc, firmly tacked or nailed, and turned over on ~~the~~ face in the form of a half-round molding, which ~~serves~~ to hold the opal glass in position.

5 strokes wide, and the spurs project beyond the width of the letter  $\frac{1}{2}$  stroke (or  $\frac{1}{8}$  inch in this case) on each side. The lines forming the vertical sides of the square are found to be numbered separately for each letter, according to its width. Thus, the lines between which the letter A is drawn, exclusive of spurs, are numbered from 1 to 6; W requires seven spaces, and is limited by lines 1 and 8; M lies between lines 1 and 7; etc. All the letters being of the same height, they are included between the same horizontal lines; before, the spaces between the lines *a*, *b*, *c*, etc. to *f* are each  $\frac{1}{5}$  the height of a letter. In referring to any particular part in a letter, it is necessary simply to name the two lines that intersect at or near that point. For example, *6d* would be the intersection of vertical line 6 and horizontal line *d*, and would refer in the letter L to the extreme upper left-hand corner of the lower extremity of the letter; while in the letter W it would refer to the intersection of the interior cutting outlines of the right portion of the letter. These relations must be borne in mind as the plates are studied.

The Full Block shown on this plate, and the Half Block, which is the title of the next plate, are the only styles of letters given here that can be classified as strictly mechanical. Truly all letters are somewhat mechanical, as their straight lines are drawn with a ruling pen, though the curved portions may be drawn freehand with the point of the red-sable brush. The style shown on this plate, however, is strictly mechanical, as no curves or irregular lines enter into its construction, and it can be drawn exclusively with a straightedge and pencil. The slightest curve or irregular line would require the free use of the hand, and call on the judgment of the eyes to make the letters symmetrical and true. This plate is a simple one, but remember the comparative width of all the letters and the exact position of every detail of each letter will require close attention and study.

The Full Block letter is made square, occupying, exclusive of the spurs, five spaces in width and five in height. The middle bars of all the letters and numerals occupy the middle

space between the lines, excepting those of the letter A—the numeral 4, which, in each case, is dropped one-half space (or  $\frac{1}{8}$  inch). The width of the letter is always measured between lines 1 and 6, thus excluding the spur. Of all the slanting strokes in the various letters, those of the N, and W are the only ones that extend to the bottom line, and are finished without a spur on the lower extremity.

Full Block letters do not possess any rounded corners, but such letters as would possess rounded lines in other styles as B, C, D, etc., are beveled on the angles with a line drawn diagonally through the corner-block (as shown in the letter B) from point *a* 2 to a point one-fourth the width of the stroke (or  $\frac{1}{8}$  inch) above *b* 1, and from *f* 5 to a point  $\frac{1}{4}$  the width of the stroke below *e* 6. With few exceptions, the width of the stroke should be the same in all parts of the letter. A slanting line therefore drawn on the inside of the letter, parallel with the outside beveled corner, and never more than the width of the stroke from it, and occasionally less, as shown in the letter B at *c* 5 and *d* 5, where the thickness of the slanting line is only  $\frac{1}{8}$  inch, which makes it appear better than when given the full width.

4. There are many irregular features in letters of every style, and it is well to become familiar with them, as they assist in learning the characteristic features of each letter. The extremities of the C are longer than those of the E or F on account of the inside bevel line of the C, which would make the extremity of that letter appear too short, while the corresponding point on the G is the same length as the E and F, in order to allow as much space as possible between this and the lower extremities of the letter. The lower extremities of the J and L are carried up to line *d* on account of the open space within these letters.

5. To determine the proper slant of the strokes in such letters as N, V, X, and Y when two given points are on opposite sides of the stroke, as well as on opposite ends, as in the letter N, for example, at *2a* and *5d*, carry an imaginary line, as nearly the proper slant as possible, in opposite

rections from each of these points and  $\frac{1}{4}$  inch apart. Point  $f$ , to the left of  $2a$  at right angles with the imaginary line drawn from  $2a$  to a corresponding point at the right of  $5f$ , the width of the stroke; this gives the true line from this point to  $5f$ . After the first line is established, measure the width of slanting stroke at the point opposite  $5f$  and draw a line to  $2a$ , which gives both lines for the slanting stroke.

6. The four points of contact, which give the position of the slanting strokes of the letter K, are as follows: From the point half way between  $c$  and  $d$  on  $2$  to  $4b$ , also from  $6e$ , a point half way between  $4$  and  $5$  on  $c$ . The slanting strokes of the letter M are joined at the base line  $f$ , and are stroke in width at base, equally divided by vertical line  $4$ . The tail, or projection, of the Q is two and one-half times the width of the stroke, and begins in its right outline at  $4$  and passes through the intersection of lines  $5$  and  $f$ .

The letter R is 5 strokes in width, but the tail is properly located  $\frac{1}{2}$  stroke to the left of line  $6$ , and is beveled less than the other letters, or from a point  $\frac{2}{3}$  stroke below  $e$ .

The letter V occupies a full-stroke space on the bottom line, while the lower extremities of W are but  $\frac{3}{4}$  stroke,  $\frac{1}{2}$  stroke on the left and  $\frac{1}{2}$  stroke on the right of line  $3$ , and  $\frac{1}{2}$  stroke on the left and  $\frac{1}{4}$  stroke on the right of line  $6$ . This letter occupies in width 7 strokes, while the M occupies but 6, with the effect of being the same or of even greater width. The other letters are of regular width, except the single stroke I and the numeral 1.

The points that govern the construction of the character & are simply the position of the points on line  $d$   $\frac{1}{2}$  stroke to the left of line  $1$ , which gives the extension of the lower part of the character, also the points at  $4e$  and  $6c$  that give the position of the slanting stroke.

7. The numeral 4 is 1 stroke wider than the other numerals, the middle bar being  $\frac{1}{2}$  stroke longer on the right of the vertical stroke than the spur at the bottom. From the point where it touches line  $1$  in the middle of the side of the block to the point where it touches line  $2$  in the middle

of the side of the block below, gives the slant of the stroke forming the numeral on the left end of the middle bar.

The numeral 5 is not cut off or beveled inside of the stroke on the upper portion of the figure. The line from 1 d to 2, is dropped at 2 d about  $\frac{1}{2}$  stroke (or  $\frac{1}{8}$  inch).

The figure 7 is the full width, although this may be sometimes shortened  $\frac{1}{2}$  stroke. The slanting stroke is from point 4 f to 6 b.

After studying carefully the instructions and characteristic features of each letter, practice these letters on Manila paper, using only the horizontal lines a and f. This will familiarize you with the relative width of the letters, before you attempt the plate that is to be sent in for correction, and also show how much of the instruction has been retained.

After drawing all the letters on the plate, outline the letters of the title Full Block and then proceed to ink in the work, using the T square and triangles, to ink the horizontal and vertical lines, and the two triangles together for the parallel diagonal lines, as explained in *Elements of Lettering*.

8. The small squares forming the guides for the lettering may be inked with clean fine lines, perfectly uniform in thickness throughout the entire plate. The outlines of the letters may be inked with a rather heavy line, as it will then be simpler to fill them in with a brush. The outline of the title Full Block will not be blacked in, and the pencil lines or squares that were drawn to aid in forming the letters will be erased.

After all the outlines and other work has been inked in, and the pencil lines and other marks have been erased, take a No. 4 red-sable brush and black the letters in solid. The utmost care is here required so as not to run the brush over the lines. Take plenty of time, and see that the ink in the brush is not too thick and that there are no hairs or pieces of lint to catch and smear the plate. Fill in each letter carefully, and complete it before you start the next. By paying careful attention to these points, a great deal of future trouble is saved. Do not hurry your work.

pieces of type corresponding to each letter are kept is called *case*, and the one containing the small letters is set in front of the compositor, while the case containing the capitals is placed above and back of this. Hence the names upper case and lower case. The old technical names were *majuscules* for the capital letters and *minuscules* for the lower-case letters, but we will confine ourselves to the simpler terms.

**11.** On a sheet of drawing paper 15 inches by 20 inches draw a rectangle 15 inches long and  $8\frac{1}{4}$  inches high as required in the previous plate. These pencil lines serve as the lines from which all measurements are to be taken. Begin at the lower left-hand corner of the border line and measure off on the left-hand line  $1\frac{1}{2}$  inches for the lower-case line,  $\frac{1}{4}$  inch space, and  $1\frac{1}{4}$  inches for the three lines of upper-case letters with  $\frac{1}{2}$  inch space between them. The title Half Block will then be  $\frac{1}{2}$  inch above the top line of letters and  $\frac{1}{2}$  inch high. Divide the space for upper-case letters into squares  $\frac{1}{4}$  inch each by means of a triangle and **T** square, and similarly divide the space for the lower-case letters into  $\frac{1}{8}$ -inch squares.

The corners of the letters are beveled at the same angle as in the Full Block; that is, in the letter B, for instance, the bevel line extends from *4a* to a point  $\frac{1}{4}$  stroke above *5b*, but the proportionate widths of some of the letters differ greatly from those in the previous plate. The letters A, M, W, and Y are each 1 stroke wider, and the character & and the numeral 4 are each  $\frac{1}{2}$  stroke wider than the other letters of this alphabet, while the L is  $\frac{1}{2}$  stroke narrower. It is well to bear these facts in mind, to compare the two plates closely, and to study the points wherein these letters differ. The left extremity of the J is the same as the Full Block, while the L is left plain. The middle strokes of the M on line *f* are finished one-half the width of 1 stroke.

**12.** The points of contact in the tail of the Q are  $\frac{1}{2}$  stroke below and  $\frac{1}{4}$  stroke to the right of *3d* and *4f*. The length of tail below the line, from *4f* is three-fourths the width of 1 stroke. The tail of the R is  $\frac{1}{2}$  stroke to the left of line *5*,

and the bevel of the tail is one-half that of other letters. A bevel also occurs in the tail near  $3d$  to the vertical stroke. The vertical stroke of the T is one-half on each side of line 3. The middle strokes of the W are  $\frac{1}{4}$  stroke wide on  $\alpha$  equally divided by line 3. On  $4f$ , these strokes are also  $\frac{1}{4}$  stroke wide, divided by line 2,  $\frac{1}{4}$  stroke to the right and  $\frac{1}{4}$  stroke to the left, and on  $4f$  this is correspondingly reversed, as likewise the outside strokes on  $\alpha$  are 1 stroke wide,  $\frac{1}{4}$  stroke within the letter at lines 1 and 5, and  $\frac{3}{4}$  stroke outside these lines.

The horizontal bar in the numeral 4 is dropped  $\frac{1}{2}$  stroke below the center, while the horizontal bar of the A is 1 stroke below. The two points that govern the left-hand outline of the numeral 4 are  $\frac{1}{2}$  stroke to the left and  $\frac{1}{2}$  stroke below  $1d$ . The character & is entirely different in outline from that on the previous plate, the points of contact being  $1c$  to  $4f$ . The upper cross-stroke is guided by points  $1d$  and  $4c$ . The other stroke parallel with this is made from points  $4d$  and  $3f$ .

**13.** The lower-case letters are  $\frac{5}{8}$  inch high and  $\frac{3}{4}$  inch wide, and their stroke is one-half the stroke of the capitals in this case  $\frac{1}{2}$  inch. All letters that extend above line  $\alpha$  are  $\frac{3}{4}$  inch higher, except the letter  $t$ , which is only  $\frac{1}{4}$  inch above all other letters extend below line  $f$   $\frac{5}{8}$  inch, except the  $g$  which is  $\frac{1}{2}$  inch below  $f$ .

The beveled end, which occurs in the vertical stroke of the numeral 5, is also used on the lower-case letters b, d, m, n, p, q, r, and u. The same rule that applies to the capitals is also observed in the lower-case letters in regard to the beveled corners. The points of contact in the lower portion of the letter  $g$  are  $\frac{1}{2}$  stroke below  $1f$  to  $2f$ , and 1 stroke below  $1f$  to 2 strokes below  $2f$ . The points of contact in the letter  $h$  are  $\frac{1}{2}$  stroke to the right of  $3a$  to  $2c$ , and from  $\frac{1}{2}$  stroke to the right of  $4f$  to  $3c$ . The  $m$  occupies 5 stroke spaces. The  $w$  is identical with the capital letter. The  $x$  is equally divided on lines 1 and 3. The  $y$  occupies 4 stroke spaces. The points of contact in this letter are  $5a$  to 2 strokes below  $3f$ , and from there to a point  $\frac{3}{4}$  stroke to the right and

$\frac{1}{4}$  stroke to the left of line 5, which will give the width of the spur, and with a radius of  $\frac{3}{4}$  stroke draw a quarter circle tangent to line b. The lower extremity of this letter is carried in the same manner to 5d.

**16.** The spur on the letter L is  $\frac{1}{2}$  stroke above line e, joining back to the stroke at an angle of  $45^\circ$ . The M is finished without the spur, at points 2a and 5a, as is also the N at 2a, and the numerals 1 at 2a, 4 at 4a, 5 at 1a, and 7 at 2f and 3f.

The character of the R is changed in this style, the change occurring in the tail of the letter, the points of contact being  $\frac{1}{4}$  stroke to the right of 4d and 5f.

The lower extremity of the numerals 3, 5, and 9, and the upper extremity of the numeral 6 are finished the same as were the simple Half Block letters, and show a full width of stroke at this point.

**17.** The only difference in the lower-case letters from those of the plain Half Block style is the spur, which is about  $\frac{1}{4}$  stroke long, and the finish of the vertical stroke letters, which are not beveled on the end as on the previous plate. These letters, as well as letters m, n, o, p, q, r, and u, are not carried above line a or below line f, but are beveled parallel with the spur. The extremities of the lower-case letters a, c, e, and s are finished in the same manner as are the capitals C, G, and S.

**18.** In drawing this plate, bear all these points of comparison well in mind, and refer frequently to the previous plate, in order to note and compare the differences. Lay off the measurements from the lower left-hand corner of the border line, precisely the same as on the previous plate, and divide the lines for letters into squares, representing in each dimension the width of the stroke of the capital letters and the lower-case letters. Draw the letters in as usual, outline the letters of the title in the center of the plate according to the measurements given, and erase the border line or such parts of it as do not enter into the formation of the lower spaces.

Insert the date, name, and class letters and number as in previous cases, and send plate in to the Schools for correction.

**PLATE, TITLE: RAILROAD BLOCK**

**19.** Railroad block, as its name implies, is designed to fill spaces, such as the frieze and dado of railroad coaches that are too long in proportion to their height to admit of the use of any other style. It is an elongated block letter, with only such changes in certain of its details as are necessary to make the elongated form practical. The height of the letter of this plate is  $\frac{7}{8}$  inch, while the breadth is  $2\frac{1}{8}$  inches, or two and one-half times its height, with the exception of the letter A, I, K, M, V, X, and Y; while the general characteristics of the letters are the same as those of the Full Block, assuming that the Full Block were designed in rectangles whose longitudinal dimensions were greater than their height in the same proportion as is the breadth to the height of these letters. Railroad Block letters can be elongated to three and sometimes even four times their height without becoming distorted or badly proportioned.

**20.** To design this plate, begin at the lower left-hand corner of the border line, as before, and point off on the vertical line of the margin six spaces of  $\frac{7}{8}$  inch each for the lines of the letters, and five spaces of  $\frac{7}{16}$  inch each between the lines of the letters. The title is  $\frac{1}{4}$  inch high and  $\frac{9}{16}$  inch above the upper line of letters. The horizontal strokes of the letters in this style are  $\frac{3}{2}$  inch wide; in locating them, lay off  $\frac{3}{2}$  inch below line *a* and above line *f* and draw lines *b* and *c*; then locate line *c*  $\frac{1}{2}$  inch above line *f*, and draw line *d*  $\frac{3}{2}$  inch below *c*. The vertical strokes are all  $\frac{5}{8}$  inch wide, and the slanting strokes are all  $\frac{1}{2}$  inch wide; but, on this plate, when reference is made in connection with any part of a letter being proportional to its stroke, the  $\frac{5}{8}$ -inch stroke is always intended. Each letter is drawn within a rectangle, the height of which is equal to the height of the letter, and the length of which is equal to the length of the letter between two vertical lines passing through its extremities, exclusive of the spur. With the exception of nine letters, all these rectangles are  $3\frac{1}{2}$  strokes wide; of these, W is the widest, being  $5\frac{2}{3}$  strokes, and N is

its upper part and  $3\frac{4}{5}$  strokes wide in its lower part. The rectangle containing it is, therefore,  $3\frac{4}{5}$  strokes long, and is located  $2\frac{1}{2}$  strokes to the right of the Z.

22. Proceed to draw the letter A, making the top of it on line *a*  $\frac{2}{3}$  stroke in width, and draw the outside slanting strokes to the lower right and left corners of the rectangle. The horizontal stroke of the A is equal in width to the other horizontal strokes of the letters, and its upper edge is on line *d*. The general length of spurs is two-thirds the width of the stroke; equal to the distance from line *d* to *f*. Spurs on slanting strokes should be twice the length on the inside to that of the outside, and they should always be made in proportion to the length of spurs on vertical strokes, measuring on line *a* or *f*. Exceptions to this rule occur in letters K, W, etc., which will be overcome by proportion, in allowing proper space between spurs. In joining the strokes of B to the horizontal lines that form the spurs on the left-hand side, the compass may be used, and a quarter circle described, the radius of which is equal to half the distance between lines *b* and *c*, and the center of the quarter circle located below the top or above the bottom and to the left of the stroke of the letter a distance equal to the radius, as shown in the letter B. The bevel in this letter extends from *a* to *b* and from *e* to *f* the full width of the stroke. In drawing C, E, G, S, T, and Z, a full width of one of the horizontal strokes (which in this case is  $\frac{3}{2}$  inch) is left between the upper extremity of the letter and the line *c*. On the letters C, G, and S, a slight spur is extended above the line *a*, and on the S, below the line *f*. The letter F has its upper extremity resting on line *c*, and the lower extremities of the letters J and L extend to line *d*. The middle strokes of the letters E and F are equal in length to one-half of the space inside these letters. The widths of A, M, N, V, and W, where their smaller extremity rests against the line *a* or *f*, vary considerably. In A, it is  $\frac{2}{3}$  stroke; in M, but  $\frac{1}{2}$  stroke; in N,  $\frac{3}{5}$  stroke; in W it is  $\frac{2}{3}$  stroke; and in V,  $\frac{4}{5}$  stroke. In drawing K, the light slanting stroke joins the body stroke midway between *d* and *e*. The heavy

slanting stroke joins the light slanting stroke on the left side at line *d*.

**23.** The slanting strokes of M and N start on the left from a point on the vertical stroke the width of the narrow stroke above line *c*. The light slanting stroke of M is joined to the top of the letter at the intersection of the heavy stroke on line *a*. Observe that the heavy slanting stroke in all letters, with the exception of the Z, inclines in the same direction, and that where two slanting strokes come together, one of which is heavy and the other is light, that the heavy stroke is on the left side in the U, V, W, and Y, and on the right side in the A, K, and M. The tail of the R is nearly  $\frac{1}{2}$  stroke to the left of the line of the rectangle enclosing the letter. The spaces between the heavy strokes of the letter T each equal the distance from line *d* to line *f*. The center of the letter V where it rests on line *f* is the middle of the base of the rectangle containing the letter.

**24.** To draw the W, extend the rectangle containing it the width of the narrow stroke to the right, or to four times the height of the letter, and divide this increased rectangle vertically into four squares. A line drawn from points  $\frac{1}{4}$  stroke to the left of  $4f$  and  $5a$  will give the right outline of right narrow stroke, and from points  $3a$  to  $2f$  will give the left line of the left narrow stroke. The only points to be observed are those of the three spaces within the letter, or the points where the narrow and heavy strokes intersect; the middle point is the width of the narrow stroke above *c* and the others are the same distance below *d*. With a knowledge of the width of the slanting strokes, these points are all that are necessary to complete the letter. The letter X is drawn so that the upper line of the heavy stroke and the lower line of the light stroke extend into the corners of the rectangle on the right side of the letter; and the lower line of the heavy stroke and the upper line of the light stroke extend into the corners of the rectangle on the left side of the letter.

**25.** The method of keeping the outlines of these strokes parallel is the same as in the case of the diagonal stroke of

the letter N described in connection with the Full Block alphabet. In drawing the Y, the upper point of contact between the diagonal heavy stroke and the vertical stroke is on line *c*, and the direction of the lower line of the heavy stroke carries it into the upper left-hand corner of the rectangle containing the letter. The vertical stroke is exactly in the center of the rectangle. The upper and lower widths of the character & have already been given, but, in order to secure the correct outline of the character, observe that the lower left-hand stroke is one-half the narrow stroke less in height on the end than the lines *de*. The slanting stroke on the right-hand side of the letter begins on line *f* at a point equal to the width of the narrow stroke to the right of the inside of the letter, and the slant of this stroke is such as to render it parallel with the upper right-hand beveled portion of the letter and keep it distant the width of the narrow stroke from that point. It is necessary to use much care in connecting the slanting stroke with the spur and to make the curves as small and symmetrical as possible, so that their apparent length is equalized.

26. Having drawn in all the letters in pencil, the title should be drawn to correspond with the letters of this alphabet, and should not exceed  $\frac{1}{4}$  inch in height. Ink in the whole plate carefully according to the rules laid down for drawing the body of the plate, leaving the inking of the title until the completion of the plate otherwise; using the drafting pen, T square, and triangle when inking the horizontal and perpendicular lines, and using the triangle alone for the bevel lines at the corners of the letters, but turning all the curves from the strokes to the spurs on the insides of the letters with the brush, freehand. The letters should then be filled in with a brush, as with the previous plates, and all construction marks erased from the plate, except the six horizontal lines *a*, *b*, *c*, *d*, *e*, and *f*, and the vertical lines closing the ends of each line of letters. In the left-hand corner the date, and in the right-hand-corner the name and class letters and number, should then be carefully printed, as usual.

**PLATE, TITLE: ROUND FULL BLOCK**

27. The Round Full Block letters are precisely the same as the Full Block, except that the corners are round, instead of beveled. The proportions of the letter are identical with those of the first plate. With the exception of the letters O and Q, the curves should all be drawn freehand. To draw this plate, begin at the lower left-hand corner of the border line, and divide the space for the lettering lines and numerals in the same manner as for Drawing Plate, title, Full Block. The stroke of the letter will then be the same as in the first plate, and, though all letters are to be drawn, only such letters will be here described as possess in some of their parts curved outlines. Information for drawing straight letters, if required, can be obtained by reference to the Full Block plate. The letter A on this plate is all straight lines, as in the former plate, but the letter B is rounded from the points  $4a$  to  $6b$ , overlapping line  $6$  slightly, in order to give full width to the rounded stroke. The bottom of the letter is rounded in the same manner to  $4c$ , where the curve stops. The inside of the letter is rounded from  $4b$  to  $4c$ , conforming with the outline above described, in order to give equal width to the entire stroke. The middle bar of this letter is exactly in the center of its height, the lower rounded stroke thereby making a duplicate of the upper one. The letters C and G are not circular, but slightly elliptic, the points through which the curves of the C pass being  $6a$ ,  $\frac{1}{2}$  stroke to the right of  $3a$ ,  $\frac{1}{2}$  stroke below  $1c$ ,  $\frac{1}{2}$  stroke to the right of  $3f$ , to  $\frac{1}{2}$  stroke below  $6d$ . The line from here to the finish of the letter at  $5d$  should be somewhat curved. The hollow curve at the top of the letter from  $6a$  to the point  $4a$  should be but a slight depression, just sufficient to show that there is a curve there. At a point  $\frac{1}{4}$  stroke above  $5c$  begin the inside curve, keeping it perfectly parallel to the line of the outside. In the letter G the rounded stroke intersects the lower half of the vertical straight stroke at  $6e$ . This is done in order to leave sufficient space on the inside between the end of the curve and the horizontal stroke.

a straight stem, has a compound curve, which at the top and bottom is perpendicular to the horizontal guide lines of the letter. Draw these letters carefully and ink them in, using the **T** square and the triangle for the horizontal and perpendicular lines, and the triangle alone for the slanting lines. The **O** and **Q** should be inked with the compass, but the curves of the other lines must be carefully drawn freehand with pen, making each line form an even stroke without ragged edges or appearance of overlapping. Draw in the title as shown, blacking in the letters with a brush, as heretofore described. Place the date in the lower left-hand corner, and the name, class letters and number in the right-hand corner.

#### PLATE, TITLE: EGYPTIAN

**30.** The Egyptian letter is very frequently referred to as Gothic—a name incorrectly given. The general formation of the letter is very similar to the Half Block, with the exception that all the Half Block letters that are beveled on the angles are round in the Egyptian style. These letters occupy 4 strokes in width, with the exception of **A**, **M**, **W**, and **Y**, and the numeral 4, each of which is one space wider, and the letters **L** and **I**, which are  $\frac{1}{2}$  stroke and 3 strokes narrower, respectively. The plate is lined in the same manner as the Half Block plate; the title  $\frac{3}{8}$  inch high is  $\frac{5}{8}$  inch above the top line of the letters. The round portion of all the letters partakes of the curve of an ellipse, and with the exception of a few special instances, the rules governing the letters **O** and **P** can be applied to the drawing of all the letters on the plate. The extreme outline of the letter **O** is a nearly perfect ellipse, the breadth of which is 4 strokes and the height 5 strokes. The curved portion of the letters **B**, **P**, and **R**, are also elliptic, the curve starting at the top of line 3 in each letter. The middle bar of the **H** is raised  $\frac{1}{2}$  stroke above the center. The left-hand portion of the entire curve of the **J** is a quarter circle, extending from point **3d** to **3e**. The right-hand portion of this curve is elliptic, joining the straight stroke about  $\frac{1}{2}$  stroke below point **4d**.

EGYPTIAN

A B C D E F G H I J K L

M N O P Q R S T U V W X

2 3 4 5 Y Z 6 7 8 9

a b c d e f g h i j k l m  
& o p q ' s t u v w x y z

The outside curve of the letter is parallel to the inside curve. The points of contact in the letter K are from  $5a$  to  $\frac{1}{2}$  stroke below  $2d$ ; the other slanting stroke is from point  $5f$  to the line  $c$ . The letter M extends to line  $f$  with its slanting strokes, and is  $\frac{1}{2}$  stroke wide on the line  $f$ , while the lower part of the slanting stroke of the N is slightly less than a full stroke in width. The curve of the tail of the R at  $5e$  is a quarter circle, the radius of which is  $\frac{1}{2}$  stroke, the outside line being made parallel to it. The inside curve of the U is a semicircle; the outside curve is elliptic, and joins the upright strokes at points  $1e$  and  $5e$ . The V and W are  $\frac{3}{4}$  stroke wide where they rest on line  $f$ . The central portion of the W is  $\frac{1}{2}$  stroke wide where it rests against line  $a$ . The angle of the left-hand portion of the numeral 4 is  $45^\circ$ , passing through the point  $1d$ , the upper slanting stroke of the figure crossing line  $1$ ,  $\frac{1}{2}$  stroke below the point  $1c$ . The horizontal stroke of the figure is  $\frac{1}{2}$  stroke each side of line  $d$ . In making the figure 8, the stroke between line  $c$  and  $d$  is reduced about one-eighth of its regular width in order to prevent the letter from looking top heavy. The character & occupies three spaces in width above, and five spaces below its horizontal center line, and the middle stroke is reduced about one-eighth of the regular width. The lower-case letters are to be drawn as shown, following the same general directions as were given in connection with plate entitled Half Block.

**31.** The lower-case letters are three spaces wide by five high; they are, therefore, more elliptic in form than the capitals, and are drawn from a point midway between  $2$  and  $3$  in all rounded letters, as the o. An exception to this occurs in such letters as h, m, and n, in which case the curve forming the top of the letter touches  $a$  at line  $3$ . The horizontal strokes of the f and t extend  $\frac{1}{2}$  stroke on either side of the vertical. The vertical strokes of the letters m, n, p, q, r, are extended above the line  $a$   $\frac{1}{2}$  stroke to the right, and are carried below the line in a corresponding manner on the letters b, d, and u. In the letters a, h, m, n, u, the curved outline of the letter joins the vertical stroke on lines  $b$  and  $e$ .

The letter *g* extends 4 strokes below *f*; the lower portion of the letter is  $\frac{1}{2}$  stroke below *f* at its center, while the upper extremity reaches a point 1 stroke above *a*. The curved end of the vertical strokes of the letters *a*, *j*, and *t* occupy but  $\frac{1}{2}$ -stroke space, while that of the *f* occupies a full-stroke space.

Having finished drawing the letters in pencil, ink the plate carefully, drawing all horizontal lines with the **T** square and all vertical lines with the triangle, but turning all curves freehand, using a No. 3 red-sable brush, as none of the letters will admit of the use of the compass to advantage. Draw in the title; black in letters on the body of the plate; put the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner, as before.

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#### PLATE, TITLE: ANTIQUE EGYPTIAN

**32.** The form of **Antique Egyptian letter** is almost identical with the plain Egyptian, the main distinction being observed in the addition of a spur at the angles of the letters, but no variation occurs in the proportion of the letter or its stroke. This style is very popular with sign painters and letterers, owing to the adaptability of the letter to a great variety of forms, to suit certain specific conditions. Some letterers make the spur much more exaggerated than shown on this plate, and others make it scarcely perceptible. The examples given herewith, however, may be taken as an average, wherein the spur projects about  $\frac{1}{2}$  stroke. All letters having a horizontal stroke, as the *E*, *L*, etc., have these strokes finished with a beveled end, on which the spur is added at the same angle. The ends of the strokes of the *C* and the upper stroke of the *G* and *S*, and figures 2, 3, 5, 6, and 9 are beveled at an angle opposite to that of the other letters referred to above. The bevel shown on the upper terminal of *C* is made by drawing a line from a point  $\frac{1}{4}$  stroke to the right of  $5a$  to a point  $\frac{1}{3}$  stroke to the left of  $5c$ . The middle bar of the *A* is 1 stroke below the center; the middle bar of the *H* is  $\frac{1}{2}$  stroke above the center; while the middle

A B C D E F G H I J K L

M N O P Q R S T U V W X

2 3 4 5 Y Z 6 7 8 9

o p q r s t u v w x y z  
&  
a b c d e f g h i j k l m n

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bars of the E and F are exactly in the center. The J is finished with a spur at  $5e$ , as well as just above  $1e$ . The points that determine the inclination of the strokes of the K are from  $5a$  to  $\frac{1}{2}$  stroke below  $2d$ , and from  $4f$  to the intersection of the upper slanting stroke with line  $3\frac{1}{2}$  stroke above  $d$ . The two slanting strokes of the M meet in the center of the letter at a point on line  $f$ , and no spurs exist on the insides of the slanting strokes at the top. The end, though usually finished with a point at  $5f$ , as on this plate, is often finished the same as in the plain Egyptian, to which the spurs are added. The tail of the Q is cut on an angle of  $45^\circ$ , the shorter side being 1 stroke in length and the longer side being equal to the distance from  $2e$  to  $3f$ . The tail of the R is a slanting stroke; the points of contact are  $4d$  to  $5f$ . The strokes of the W come to a point on line  $a$  to correspond with the M. The corner of the Z is beveled off at about the same angle as the interior of the 5 and top of character &. The long slanting stroke of the character & is drawn from a point  $\frac{1}{2}$  stroke to the left and below  $1a$  to a point  $\frac{1}{2}$  stroke to the right of  $4f$ . The corresponding, or upper, slanting stroke, from its top to the beginning of the curve, is made from a point  $\frac{1}{2}$  stroke to the right and below  $4a$  to a point  $2d$ . The other slanting stroke intersects the long stroke 1 stroke below this point, and is parallel with upper stroke, finishing on line  $c$ . The curve by which these strokes are united is  $\frac{2}{3}$  stroke to the left of line  $1$  at  $e$ . The middle bar of the numeral 3 is beveled at a slight angle, as shown. The character of the numeral 5 is changed at the point where the vertical stroke joins the curved bottom portion of the numeral 5. The point added below the line  $d$  is necessary to fill out the space to the line of the curve. The numerals 6, 8, and 9 are about  $\frac{1}{3}$  stroke wider than the other characters, but are similar in other respects to the same numerals in the plain Egyptian alphabet.

**33.** The lower-case letters are in many respects the same as those in the plain Egyptian alphabet, although many exceptions occur. All strokes extending above the line  $a$

are cut at an angle of  $60^{\circ}$ , to which the spur is added at the same angle. This characteristic is also observable on letters of shorter height, such as the i, j, m, n, etc., but the ends of the strokes of all letters extending below the line are finished without this detail. Other information concerning the lower-case letters, as to their proportion, spacing, etc., will be found in the Drawing Plate, title, Egyptian.

Having finished drawing the letters in pencil, they should be inked carefully, drawing all horizontal lines with the T square and all vertical lines with a triangle, but making all curves freehand, using the red-sable brush, as none of the letters will admit of the use of the compass to advantage. Draw in the title, as shown; black in the letters in the body of the plate carefully, lettering the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner, as before.

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#### PLATE, TITLE: ANTIQUE EGYPTIAN (LIGHT)

**34.** In drawing this plate, all guide lines will be omitted, except the lettering lines that limit the top and bottom of the letter. It will therefore be necessary to count the number of letters in each line, and to divide this line proportionately, so that each letter will fill its proper space. The capital letters and figures in this plate are  $1\frac{1}{4}$  inches high, as in the previous plates, and the average width is 1 inch, but the letters A, M, O, Q, S, W, etc., are wider than the average, and the letters I, L, and N are narrower, as will be pointed out hereafter.

On the top line are twelve letters, the widest of which, A, is  $1\frac{1}{4}$  inches; the narrowest, the I, being but  $\frac{3}{2}$  inch, or equal to the width of 1 stroke. Commencing at the lower left-hand corner, divide the plate as follows for the first line of letters:  $1\frac{1}{2}$  inches above the lower border line draw a line to limit the top of the lower-case letters;  $1\frac{1}{2}$  inches above the lower border line, draw a line to limit the top of the body of the lower-case letters; and  $\frac{1}{2}$  inch above the lower border line draw a line on which the bodies of the lower-case

ANTIQUÉ EGYPTIAN (Light)

ABCDEFGHIJKLMNOPQRSTUVWXYZ  
12345.6789  
abcdefghijklmnpqrstuvwxyz

letters rest. The g, j, p, q, and y will then extend below this line on the lower border line. Three-fourths inch above the top line of the lower-case letters draw a horizontal line on which the numerals shall rest. The numerals, like the two lines of letters above, are  $1\frac{1}{4}$  inches high, with a space  $\frac{1}{8}$  inch between them and the line above. The title is  $\frac{5}{8}$  inch above the top line of lettering, and its letters are  $\frac{3}{8}$  inch high. This style of lettering is an extreme form of the Egyptian letter, and in many respects is the most useful form it assumes. The lines are extreme and do not follow the conventional regularity of the lines of letters on the Full Block or Half Block plates, but are governed, nevertheless, by certain rules that must be followed carefully to observe their proportions, particularly in this plate, as it is the first one to be drawn entirely freehand.

**35.** Begin this plate by drawing the letter A, which rests on the lower line, 5 strokes to the right of the left-hand border line. The width of the letter, exclusive of its spurs, is the same as its height, and the cross-bar is  $2\frac{2}{3}$  strokes above the bottom line. In connection with this plate we meet with an entirely new detail in lettering, as seen at the top to the left of the letter A. This detail is called the *cyma*, from the Greek *Kυμα*, *kyma*, meaning "a wave." Its purpose, in most instances, is to fill the space between the slanting parts of the letter, or extremities, that are likely to cause wide openings when two letters are placed together. It is also used in some places to form the finishing stroke of a letter, as in the Q and Z. In subsequent plates, its use in the construction of letters will be observed, as it forms a component part in many letters in the German Text, Old English, and Church Texts. The cyma on the letter A is 8 strokes in length and 1 stroke to the left of the point of A.

The vertical stroke of the B is about 3 strokes to the right of A, but the length of the line should be so proportioned that the letters are evenly divided, and not lay off each letter by measurements taken from its neighbor. The middle bar of the B is 8 strokes above the bottom line; the upper portion

of the letter is 5 strokes from top line, and the lower part projects 1 stroke beyond the upper part. The curves of the B are carried into the middle bar independently of each other, and start from the horizontal bars at about the center of the letter.

**36.** The C is a perfect circle as far as it goes, and the spur on the inside is about 2 strokes below the top line; the lower extremity of the letter projects a full stroke beyond the top, and finishes in a point 3 strokes above the lower line. The curved portion of the letter D is semi-circular, and becomes tangent to the horizontal top and bottom lines 3 strokes to the right of the vertical line.

The middle bar of the E, F, G, and H are all on one line, 4 strokes below the top of the letter. This bar in the E and F extends to within 2 strokes of the right extremity of the letter. The slanting stroke of the K begins 3 strokes above the lower line, and extends to the top line, where the end is beveled at an angle of about  $60^\circ$ . The L is 1 stroke narrower than the other letters, and the cyma is placed over it so that its lower extremity is even with the right-hand portion of the letter.

The M is 2 strokes wider than the other letters and starts  $\frac{1}{2}$  stroke to the right of the border line, to leave sufficient room for the spur. In some cases, the M is made precisely like an inverted W, except that at the union of the two slanting strokes the letter is finished flat with a spur, instead of being pointed, as in the W. On this plate, the middle slanting strokes of the M are brought to a point one-half the width of the letter below the top line. The slanting stroke of the N commences on the vertical stroke, one-fourth the width of the letter above the bottom line.

**37.** On this plate, there is a difference between P and R that was not seen on previous plates. The loops are entirely different in style, the middle bar of the P being  $4\frac{2}{3}$  strokes from bottom line, while the same stroke of the R is  $6\frac{2}{3}$  strokes above the bottom line. The tail of the R intersects the middle bar at a point where the curve becomes tangent. The

letter S begins to curve each way from a point in the center of the letter on a line with the middle bar of R. The letter is narrower at the top than at the bottom, the proportions being about the same as in the numeral 3, hereafter described.

The W is practically two V's joined at a point  $2\frac{2}{3}$  strokes below top line. The cyma over the W is so placed as to fill the space between its upper extremity in the same manner as the cyma is placed in the lower part of M. This is not a component part of the letter, however, and in many cases may be omitted with advantage.

The vertical stroke of the Y extends  $6\frac{2}{3}$  strokes above the bottom line, the letter being 12 strokes wide on top. The X is 9 strokes wide on top and 4 strokes wider on the bottom. Z and the numeral 7 are of the average width on top, and the former may be finished in the same manner on the bottom, or with a cyma, as shown on the plate.

The character & is 10 strokes wide on the horizontal part of the letter, the longer slanting lines extending to the right 1 stroke beyond the line of top of letter. This line, divided into three equal parts, will give about the location where the other two slanting strokes intersect the longer one. These two strokes are parallel and joined with a semicircle, as shown.

**38.** The figures differ somewhat from the letters on account of their elliptic form. The numeral 2 curves in each direction from a point one-half its height. The numeral 3 is much narrower at the top than at the bottom, and its sides can be enclosed in an isosceles triangle whose height is about three times the height of the letter. The middle bar of the figure 3 is 7 strokes from the bottom line, and is carried to the left and beveled off in line with the bevel of the top stroke. The middle bar of the 4 is 7 strokes from the top line, and extends  $9\frac{1}{3}$  strokes to the left and 4 strokes to the right of the vertical line. The upper curve of 5 is  $4\frac{2}{3}$  strokes from top line, and upper portion of the elliptic curve of 6 is  $1\frac{1}{2}$  strokes below the top line, which distance is the same between the lower curve of 9 and the bottom line, 6 and 9 being simply reversed.

The stem of the 7 extends below the line 4 strokes, and the figure is finished horizontally with a spur. The figure 8 is 12 strokes long on the top line, and the slanting strokes of the figure intersect  $2\frac{1}{2}$  strokes below the top line and are joined on the loop, which is 12 strokes wide, and forms the lower portion of the figure.

**39.** The lower-case letters are similar in general outline to those of the Half Block, but in some respects are very different. It must be remembered that the lower-case letters should always be made so that the long strokes are the height of the capitals, and the others three-fifths this height when they are used together. The letter a finishes on the bottom line by its vertical stroke coming to a point, as is also the case with the letters d and u.

In proportioning the lower-case letters, they should bear the same relations with reference to their height as do the capitals, that is to say, their width should be four-fifths their height, as shown on this plate. In measuring the height of a letter, measure only the body, not counting the part that extends above the line, as in b and k, or extends below the line, as with j and y. The strokes of the letters should also be in proportionate width to the stroke of the capitals, and those strokes that extend above and below the line should all extend to the same height, which was not the case with the Half Block. The cross-bars of the f and t are longer in this than in the previous plate, and are on a line with the body of the letter. The top of the f is about two-thirds the regular width of the letter. The upper portion of the g is identical with the letter o. The letters c and e finish their lower extremities with a point, and the right-hand portion of the r extends two-thirds the width of the letter, and is the width of a stroke above the top line. The s, v, and w are precisely the same as the capitals, the only difference being the size. Space these letters by the eye, drawing every outline lightly in pencil, in order to get them in their required positions on the plate.

**40.** Having accomplished this, start with the letter A and draw, exclusively in pencil, each individual letter, making the

wider, and the letter Z and the character & are about 25 per cent. wider. The numerals 2, 5, 6, 8, and 9 are each about 10 per cent. wider than the average width of the letters. It is not intended that all these dimensions and irregularities will be carried in the mind, but by paying attention to these proportions as the letter is drawn, and thereby accustoming the mind to nothing but letters of perfect proportions, one will soon be able to draw a letter that bears its proper relation of width to height and weight in stroke, without making any mechanical measurements to determine the stroke, and thus learn why each letter is given certain characteristic forms. The rapidity and ease with which this result is accomplished will depend entirely on the amount of practice given to the work, with strict attention to the rules set forth.

**43.** The spurs of these letters are about  $\frac{1}{8}$  inch long, although in exceptional cases, such as the E or L, the spur is made much longer in order to balance the stroke. All vertical strokes are finished on their upper and lower extremities by a concave line. This line is the arc of a circle, the radius of which is  $1\frac{1}{2}$  inches above and below each vertical stroke. Letters having three parallel horizontal strokes must have these strokes somewhat reduced in width, in order to leave a space within the letter, as in the B and E. In the letter S and the character &, this is accomplished by carrying the stroke above the line and thereby drawing the letter open. In the letter C, the lower portion of the stroke extends  $\frac{1}{8}$  stroke beyond the upper portion of the inside point, and on the E, F, J, and Z, a slight spur is added to the outer extremity, which carries the letter above the line. The lower portion of the horizontal stroke of the E is not a straight line but a compound curve, the center of which, on the upper side, is on a line with the middle bar of the letter; the length of this middle bar is equal to the width of the stroke, or one-third the width of the letter. The middle stroke of the H is  $1\frac{1}{4}$  strokes above the bottom line. The J is brought to a point at the left of its lower curve; the top of the curve rises to within 1 stroke of the top line of the letter. The upper slanting stroke of

the K and the right strokes of V and W are rested about  $\frac{1}{2}$  stroke above top line of letter. The right spur of this projecting stroke rests either on the top line, as in K, or  $\frac{1}{2}$  stroke above it, as in V and W. The points from which the slanting strokes of the K are drawn are  $\frac{1}{6}$  stroke from the bottom line on the right side of the vertical stroke and the same distance from this point on the right side of the upper slanting stroke. The horizontal stroke of the L is a compound curve similar to that of the E, except that it is about  $\frac{1}{2}$  stroke shorter. The cyma added to this letter is about two-thirds the width of a stroke.

**44.** The letter M is brought to a point on the lower line. The letters O and Q are not perfect circles, as in the Light Egyptian, but are  $\frac{3}{8}$  stroke wider than their height. The horizontal stroke of G, the tail of the Q, and the character & are curved somewhat in the shape of a horn. The point in each case rests within the letter. The outside end is terminated with a concave form, similar to the vertical strokes in the letters. The tail of the R is carried below the line in the same manner as the top of the K is carried above the line. The slant of the stroke of the R starts at a point  $\frac{2}{7}$  stroke from the vertical line, and is carried so that the outside of the stroke is directly below the curve of the letter.

The letter S is drawn by means of 4 vertical lines 1 stroke apart. The third line will mark width of letter to upper spur, and fourth line will mark width of letter at extreme right-hand curve. The first line will mark curve of letter on left-hand side. The letter X is equal in width to the letter Y, and the point of intersection of its slanting strokes is  $\frac{1}{6}$  stroke above the bottom line, and that of the Y the same distance from the top line. The lower stroke of the Z is similar to the letter E, except that it is cut off on the lower left side of the letter to form a beveled end. The character & is drawn with 4 vertical lines similar to those of letter S; the first line in this case determining the curved portion of the left-hand side of the letter; the fourth line determining intersection of under side of lower curve of the character and horizontal

horn stroke; the second stroke will determine the point where top of character begins to extend above top line.

**45.** In drawing the numerals, little need be said in explanation. Attention is called only to a few points, such as that the 2 is straight on the bottom line and curved on the upper portion, similar to the reverse of the upper terminal of the C; the horizontal stroke is a compound curve on top. The 3 extends  $\frac{1}{2}$  stroke above line, the point of the strokes being in center of inside space of letter.

The middle bar of 4 is  $\frac{3}{8}$  stroke from the bottom line, and extends the width of the stroke of the letter to the right, and is carried to the left only far enough to give a small opening inside the figure. The figure 5 is carried  $\frac{1}{2}$  stroke below the line. The point of the vertical stroke is  $\frac{3}{4}$  stroke above the bottom line. The 6 extends  $\frac{1}{2}$  stroke above the line and is  $\frac{5}{8}$  stroke from the top line to upper side of curve.

The 7 extends  $\frac{1}{2}$  stroke below line, and the right point is vertical below center of horizontal stroke. The figure 8 is composed of two ellipses, the lower one being  $\frac{1}{4}$  stroke wider than the upper one. The 9 is just the reverse of 6.

**46.** In drawing the figures, it will be necessary in some places to diminish the width of a stroke in order to leave sufficient space within. Draw all these letters with pencil, freehand, in precisely the same manner as the previous plates; then ink them in, freehand, without the use of the T square and triangle, other than to draw the pencil guide lines. The letters must then be filled in as in copy, the title drawn and blacked in, as shown, and the date, name and class letters and number put in their proper places, as heretofore. The student is not expected to produce absolute duplication of the letters on these sheets. By this time, he should have become familiar enough with the forms and proportions of the strokes, widths, and heights of all letters to vary them slightly from the dimensions given on this plate, without seriously impairing their proportions;

therefore, in drawing this exercise, the proportions of the strokes may be varied slightly in some places, if in the student's judgment this will improve the appearance of the letter.

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#### PLATE, TITLE: FRENCH ROMAN

**47.** French Roman letters possess the same general proportion as the Full Block, that is, they have a width equal to their height. This width varies in some letters, however, precisely as it did in the Full Block style, and the details of such variation will be given as the letter in question is discussed. The characteristic difference between the Roman, Egyptian, and Half Block letters lies in the use of two separate but uniform widths of lines to form the letter. These are distinguished under the names of *stroke*, for the heavy portion, and *fine line* for the slender portions of the letter. On this plate, the four lines of letters and numerals are each  $1\frac{1}{4}$  inches high, and  $\frac{1}{4}$  inch apart, and the stroke is  $\frac{5}{16}$  inch, or one-fourth the height, and the fine line is one-fifth the stroke. The title is  $\frac{7}{16}$  inch high and  $\frac{9}{16}$  inch above the line of letters. To draw this plate, divide the drawing paper above the lower border line, as in the previous example, and then lay out the letters lightly, in pencil (freehand), so as to space them equally along the lines.

**48.** The letter A is commenced  $2\frac{1}{2}$  strokes from the border line, and is  $4\frac{1}{2}$  strokes wide at the base. The apex of the A is the center of the letter (as is always the case in upright letters), and the top horizontal bar is  $\frac{1}{4}$  stroke above bottom line. The spurs on the bottom make the foot of stroke 2 strokes wide, and the foot of the fine line 1 stroke wide.

The vertical stroke of B is about  $1\frac{1}{4}$  strokes to the right of the A, and the intermediate bar is  $2\frac{1}{2}$  strokes from the bottom, as are also the intermediate bars of E, F, and H. The width of the top of B is exactly 4 strokes, but the lower curved portion projects  $\frac{1}{4}$  stroke more on the right side, and the spurs, top and bottom, extend an equal amount to the left. A vertical line drawn  $1\frac{1}{2}$  strokes to the right of the upper

A B C D E F G H I  
J K L M N O P Q R  
S T U V W X Y Z &  
1 2 3 4 5 6 7 8 9

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curve of the B will be tangent to the left curve of C, and  $4\frac{1}{4}$  strokes to the right of this line another vertical line will limit the fine lines of C. The lengths of each of the spurs, on the ends of the fine line of the C, is 1 stroke, the top one of which touches the top lettering line, while the bottom spur is  $\frac{1}{4}$  stroke above the lower lettering line. One and one-half strokes to the right of C is the vertical stroke of letter D, which is 4 strokes wide. The curve of D commences  $\frac{1}{2}$  stroke to the right of the vertical stroke and the fine line gradually expands in an elliptic curve until it is a full stroke wide at the center. The spurs on D are the same as those on B. The letters E and F are each 4 strokes wide, the vertical stroke of the E being 1 stroke to the right of D, and the vertical stroke of the F  $1\frac{1}{4}$  strokes to right of E. The spurs on these letters are each 1 stroke long, and incline from the letter at such an angle as would make either of them intersect the opposite lettering line about 1 stroke away from the letter; that is, if the line of the lower spur of E were carried to the top of the letter, it would intersect the top lettering line 1 stroke to the right of the letter. The intermediate bars of E and F are  $1\frac{1}{2}$  strokes long. With the exception of the vertical stroke, G is precisely like C; this extends  $\frac{1}{4}$  stroke to the right of the fine line. The lower fine line joins the vertical stroke, on the outside,  $\frac{1}{2}$  stroke above the bottom, and the top of the vertical stroke is  $2\frac{1}{2}$  strokes above the bottom line. There is a space of  $1\frac{1}{2}$  strokes between G and H, and a space of 2 strokes between H and I. H is 4 strokes wide.

The letter J is 4 strokes wide, and its left extremity touches the left border line; the intersection of the curve and vertical stroke on the right is 1 stroke above the bottom line. The letter K is  $4\frac{1}{4}$  strokes wide, and the fine line intersects the vertical stroke  $1\frac{1}{2}$  strokes above the bottom. The slanting stroke intersects the fine line  $1\frac{1}{2}$  strokes from the vertical stroke on the fine line. Excepting that the spur is  $1\frac{1}{4}$  strokes in length, L is similar to E.

**49.** The letter M is 5 strokes wide. The intersection of the slanting stroke and fine line is on the bottom lettering

line, exactly midway between the vertical stroke and vertical fine line. The lower side of the slanting stroke, where it intersects the vertical fine line, and the lower side of the slanting fine line, where it intersects the vertical stroke, is  $\frac{1}{6}$  stroke below the top lettering line. The letter N is  $\frac{1}{2}$  stroke narrower than the average 4-stroke letter, and the under side of the slanting stroke intersects the left vertical fine line  $\frac{3}{4}$  stroke below the top line, and the right vertical stroke at its intersection with bottom lettering line. In outline, the O and Q are complete circles. The middle line of the P is  $1\frac{1}{2}$  strokes above the lower lettering line, while the middle line of R is 2 strokes above, and the slanting stroke intersects the fine line 1 stroke to the right of the vertical stroke of the letter. The S is  $3\frac{2}{3}$  strokes wide at the top and 4 strokes wide at the bottom; on the vertical center line of the letter the double-curved stroke is  $1\frac{1}{2}$  strokes below the top line, and the spur on the end of the lower fine line is  $1\frac{1}{4}$  strokes in its vertical length. The U is 4 strokes wide, as is also the Z, and the V is similar to an inverted A. The W is  $6\frac{1}{2}$  strokes in width at the top, and its two lower points intersect the lower lettering line, 3 strokes apart. The point where the middle stroke and fine line meet on the top line is an equal distance from the inside of the left stroke and the inside of the right fine line; a vertical from this point drawn to the bottom letter line will give the position of the points reached by the strokes and fine lines on the bottom line. The right point is 1 stroke from the vertical line and the left point is 2 strokes. The X is  $3\frac{4}{5}$  strokes on top and  $4\frac{3}{5}$  strokes wide at the bottom. The Y is  $4\frac{1}{4}$  strokes wide on top, and the vertical stroke is exactly in the center of the letter and  $1\frac{1}{2}$  strokes high on the left side. The character & is  $3\frac{1}{4}$  strokes wide on top. The curved portion of the character extends  $\frac{1}{6}$  stroke to the left of the top fine line, while the center of the slanting stroke, where it rests on the bottom line, is directly beneath the right end of the top fine line. One slanting fine line intersects the slanting stroke 1 stroke below the top, and the other intersects the slanting stroke  $\frac{1}{6}$  stroke from the bottom line, and then terminates in a horizontal spur  $1\frac{1}{4}$  strokes from the top line.

50. In outlining the numeral 2, the space within the top of the figure must be as large and full as possible, without curtailing the space below. The horizontal stroke is  $4\frac{1}{2}$  strokes long and is finished with a concave end and spur, as are also the 5 and 7. In each of these numerals, the point of spur is  $\frac{1}{2}$  stroke from the end of the horizontal stroke to which it is attached. The numeral 3 is  $3\frac{1}{2}$  strokes wide on top and  $4\frac{1}{2}$  strokes wide on the bottom; the intermediate fine line is  $2\frac{1}{2}$  strokes from bottom, and extends into the figure about two-thirds of the inside space. The horizontal fine line of numeral 4 is  $1\frac{1}{2}$  strokes above the bottom of the figure, and extends  $2\frac{1}{2}$  strokes to the left of the stroke and  $\frac{1}{2}$  stroke to the right. The horizontal stroke of 5 is  $3\frac{1}{2}$  strokes long, and the top of the intermediate fine line is  $1\frac{1}{2}$  strokes from the upper lettering line. The figure is 4 strokes wide on the bottom, and finishes  $\frac{1}{2}$  stroke to the left of the vertical fine line.

The 6 is  $4\frac{2}{5}$  strokes wide, and the intermediate fine line is  $1\frac{1}{5}$  strokes from the top. The upper fine line, with the spur, finishes  $\frac{1}{2}$  stroke short of the full width of the figure. The 7 is 4 strokes wide on top and  $1\frac{2}{5}$  strokes on the bottom, and its foot rests  $1\frac{1}{2}$  strokes to the left of the end of the horizontal stroke. The 8 is  $4\frac{1}{2}$  strokes wide on the bottom, and is identical with the right half of the duplicate on two sides of a center line. The 9 is an inverted 6.

Draw these letters in pencil, carefully proportioning each letter of both the plate and the title, measuring each stroke. The inking in must be done freehand with a red-sable brush, and the letters carefully blacked, as before. Insert the date in the lower left-hand corner of the plate, and in the lower right-hand corner put the name and class letters and number.

The B is 2 strokes to the right of the A, and  $6\frac{1}{2}$  strokes wide at the top and 7 strokes wide at the bottom. The intermediate fine line is 4 strokes above the bottom line, and the lower space within the letter is  $\frac{1}{2}$  stroke wider than the upper space.

The C is  $1\frac{1}{2}$  strokes to the right of the B and is 7 strokes wide to the spur on the top line, but the lower fine line extends the width of 1 stroke, and finishes 2 strokes above the bottom line. The vertical stroke of the D is  $1\frac{2}{3}$  strokes to the right of the C, the letter being 7 strokes wide, and the fine line commences to curve at a point twice the width of the stroke to the right of the vertical stroke. The middle horizontal fine lines of the E, F, G, and H are 2 strokes below the top line, and in E and F, 4 strokes long. The spurs on C, G, and S are rounded from the fine line, giving it an extra thickness at this point. The horizontal middle bar of the G is 4 strokes in length. The space between the D and the E and the E and the F is 2 strokes; between the F and the G only  $\frac{1}{2}$  stroke; and between the G and the H and the H and the I is  $2\frac{2}{3}$  strokes. The letters E and F are 6 strokes and the D, G, and H are 7 strokes in width. The curve of the J intersects the vertical stroke 1 stroke above the bottom line. The fine line of the letter K intersects the vertical stroke 2 strokes above the bottom line, and extends 1 stroke above the top line; the slanting stroke intersects the fine line  $3\frac{2}{3}$  strokes from its lower end. The middle slanting strokes of the M are brought to a point 3 strokes above the bottom line; the top of the letter is 3 strokes narrower than the bottom, the full width on the bottom being 8 strokes. The slanting stroke of the N joins the vertical fine line on the right  $1\frac{1}{3}$  strokes above the bottom. The O and Q are 8 strokes wide; the P and R are 7 strokes wide; and their middle fine lines are  $2\frac{2}{3}$  strokes from the top line. The cyma of the Q rests on the bottom line on the right side of the letter, and on the left is 2 strokes above within the letter.

**54.** The intersection of the slanting stroke of the R with the middle fine line is 2 strokes to the right of the vertical

stroke, and its lower end is cut off at an angle of  $45^\circ$ , the right spur resting on the bottom line. On a vertical center line drawn through the S, the middle stroke is  $3\frac{1}{4}$  strokes from the bottom line; the fine line on top is cut off 1 stroke shorter than the projection of the curve beneath it, while the fine line at the bottom projects 1 stroke beyond the curve above it. The full width of the S at the bottom is  $7\frac{1}{4}$  strokes. The T is 7 strokes at the top, and the U is  $6\frac{1}{2}$ . The fine line of the letter V extends above the lettering line in the same manner as the fine line of the K. The intersection of the interior lines of the W is equally divided between the stroke and fine line, and is  $1\frac{1}{2}$  strokes below the top line. The space between the points of the letter on the bottom is 5 strokes, and the cyma is drawn about two-thirds of the space within the letter. In the letter X, the fine line intersects the stroke  $2\frac{1}{2}$  strokes below the top line, and the letter is 8 strokes wide at the bottom. The fine line of the Y intersects the vertical stroke  $3\frac{1}{4}$  strokes above the bottom, and the letter is  $7\frac{1}{4}$  strokes wide on top. The character & is 7 strokes wide at the bottom, and the lower end extends 1 stroke to the right of the upper portion. The middle bar is 4 strokes from the bottom line. The cyma is so placed as to extend  $1\frac{1}{2}$  strokes outside, and  $2\frac{1}{2}$  strokes inside, the letter, and its lower end is  $1\frac{1}{2}$  strokes above the line.

55. The numeral 1 is beveled on its upper end at an angle of  $60^\circ$ , the line of the bevel being equally divided by the top line of the letters. The upper parts of the numerals 2 and 3 are sickle-shaped, and the horizontal stroke of the 2 is straight on the bottom and curved on the top. The lower fine line of the 3 is finished similar to the upper fine line of G. The middle bar of the figure 4 is  $2\frac{1}{2}$  strokes above the lower line, and extends  $5\frac{1}{2}$  strokes to the left and 2 strokes to the right of the vertical stroke. The middle bar of 5 is 4 strokes above the bottom line; the upper horizontal stroke is 6 strokes long, and finished in the same manner as the bottom stroke of the 2. The middle bar of the 6 is 5 strokes above the bottom line, and the upper part of the figure diminishes to a point 1 stroke above the top line, the point being on a

57. The height of the letters in this plate, their size and position, the space between the lines, and also the title, are precisely the same as on the previous plate. The width of the stroke is  $\frac{1}{2}$  inch. The average width of a letter is 3 strokes, but the alphabet abounds in exceptions, so that it is not surprising to find that the number of letters of standard width are in the minority. The spur is about  $\frac{1}{4}$  stroke, and is joined to the fine line with a curve, except as pointed out in connection with the E, L, and Z, and also in the other fine lines of the letters E, F, T, and Z. The letter A is  $3\frac{1}{2}$  strokes in width. The middle bar is  $\frac{2}{3}$  inch from the bottom line, but the spurs at the top of the side end stroke are precisely the same as those at the bottom. The ends of the strokes are rendered concave by the arc of a circle whose radius is 4 strokes. The middle line of the B is  $1\frac{1}{2}$  strokes above the bottom. The lower portion of the letter is  $3\frac{1}{2}$  strokes wide and extends  $\frac{1}{2}$  stroke to the right of the upper portion. The bottom fine line of the letter C extends 1 stroke beyond the spur at the end of the top line, and the cyma is inserted, as shown, to fill the space within the letter. Observe that the curve of the cyma becomes tangent, as though it were a continuation of the inner curve of the letter. The outlines of the B, D, E, L, P, R, and Z are formed, not of a straight line on top and bottom, as in previous styles, but in the form of a compound curve, making, thereby, a wavy fine line, terminating in the E, L, and Z with a heavy curl. The horizontal fine line in the middle of the E, F, and H, and the top of the vertical stroke of the G, are  $\frac{3}{4}$  stroke from the top line. The intermediate fine line of the E and F is 2 strokes in length, and extends  $\frac{1}{4}$  stroke beyond the end of the fine line. The fine line of the K meets the vertical stroke  $\frac{3}{4}$  stroke above the bottom line. The slanting stroke of the K (measuring on the fine line) intersects the fine line 1 stroke from the vertical stroke. The left-hand stroke of the M is not given full width on the top line, in order to leave as much space as possible within the letter, and at the same time to avoid too great a projection beyond the left fine line. The intersection of the middle

stroke and fine line is  $\frac{1}{4}$  stroke from the bottom, and the letter is  $5\frac{1}{4}$  strokes in width. The letter N is  $\frac{1}{4}$  stroke narrower than the average width of the letters, and the slanting stroke intersects the fine line  $\frac{1}{4}$  stroke above the bottom. The lower line in the slanting stroke intersects the left-hand vertical line 1 stroke below the top. The O and Q are  $3\frac{1}{2}$  strokes wide. The tail of the Q is entirely outside of the letter in this style, and is somewhat of the form of a cyma, tangent to the outside of the letter below and to the right of the center line of the opening. The lower fine line of the P is  $\frac{1}{4}$  stroke above the bottom line. Notice that the width of the stroke of the S where it joins the fine line diminishes very rapidly, and is not a gradual reduction, as in the previous slants. The upper fine line is  $\frac{1}{16}$  inch within the outline of the letter, and the lower line projects  $\frac{1}{16}$  inch. The letter U possesses two very small spurs in its lower portion, and is thickened to twice the width of the fine line at the point where the vertical and curved fine lines come together. The V, W, Y, and also the K carry their fine lines above the line about  $\frac{1}{2}$  stroke, the spurs on the end of which are at right angles to the line of the letter. This feature is frequently added to the fine line of the letter A, carrying it below the line about  $\frac{1}{2}$  stroke and finishing its spurs at right angles. The width of the W is 5 strokes. To proportion the W, lay out its full width of 5 strokes on the top line, and from the right end of the letter lay off, to the left, 2 strokes on the top line, which will locate the point where the middle strokes meet;  $\frac{3}{4}$  stroke to the right of a point vertically opposite this, on the lower line, will give the point where the right stroke and fine line meet, and  $1\frac{1}{4}$  strokes to the left will give the other corresponding point. The stroke and the fine line of the X intersect at a point  $\frac{5}{8}$  stroke from the top line, the letter being 3 strokes wide on top. The vertical stroke of the Y intersects the fine line  $1\frac{1}{2}$  strokes above the bottom, and the letter is  $3\frac{1}{4}$  strokes wide on the top line. The lower left-hand angle of the letter Z diminishes to a point that projects from the letter about  $\frac{1}{2}$  stroke. The character & extends  $\frac{1}{2}$  stroke to the left of a vertical line

a tangent to its upper curve on the left side, and the forming the lower right termination, on its fine line, usually divided above and below the point where it is d to this line, the lower curve of the cyma being ent to the bottom line, and the upper curve reaching strokes above it.

• The instructions for drawing this plate are much less led than the other plates, as by this time the student d be sufficiently familiar with the letter forms to readily n any of the characteristics without detailed explana-

Attention is particularly called, however, to the careful ng of the letters, particularly those of the top line, as etting these in their proper places it is a simple matter cate others beneath them in their proper relative ions. Having drawn the letters carefully in outline, should be inked in and then blacked, as usual, with a brush, after which the date should be placed in the left-hand corner, and the name and class letters and per in the right-hand corner, as before.

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**PLATE, TITLE: ROMAN (NEW YORK)**

• There are no styles of lettering more generally used, more convenient application for various purposes, than Roman letter. Three general styles of the Roman letter be given here, and attention is called, particularly, to rincipal characteristic differences in the styles as well as e general formation and construction of the letters. In **New York Roman**, the main characteristic is the thin- of the fine line, and the symmetrical proportions of letters; for, though the upper and lower halves of such s as the E, H, and S are not identically the same in and proportion, they are arranged to appear so to the and the actual difference is difficult to discern, unless letter is turned upside down.

• In drawing this plate, make the four lines of letters ches high, as before, with the spaces between them  $\frac{3}{4}$  inch,

ROMAN  
(NEW YORK)

A B C D E F G H I I  
J K L M N O P Q R  
S T U V W X Y Z &  
1 2 3 4 5 6 7 8 9

the main line of the title  $\frac{3}{8}$  inch high, and  $\frac{5}{8}$  inch above the top line of the letter; the second line of the title  $\frac{1}{2}$  inch high, and  $\frac{3}{8}$  inch above the top line of the letters. The stroke of this letter is  $\frac{5}{16}$  inch, or one-fourth of the height; the spurs are  $\frac{1}{8}$  stroke on all letters, except the E, F, L, T, and Z, where they are larger, as will be described later. The curve of the spur from the fine line to the stroke is, in most cases, a quarter circle, the radius of which is  $\frac{1}{8}$  stroke, and the center  $\frac{1}{8}$  stroke from the vertical stroke and the fine line, to both of which the quadrant must be tangent.

61. The letter A is located at the foot of its fine line 2 strokes from the left-hand border; the middle fine line is  $1\frac{1}{2}$  strokes above the bottom line, and the spurs on the end of the fine line increase its length to 2 strokes at the base, and that of the slanting stroke to 3 strokes. The lower portion of the B extends  $\frac{1}{4}$  stroke to the right of the upper portion. The letter C is designed so that its interior outline forms a perfect ellipse 3 strokes in width and the height of the letter, the crescent-shaped portion of the stroke to the left of the letter being  $\frac{1}{8}$  stroke thicker at its center than the vertical strokes in the same alphabet. The spurs on the E, F, L, T, and Z, extending 1 stroke at right angles to the fine line, are returned to the fine line at an angle of  $45^\circ$ , and are rounded into it with a slight curve. The middle fine lines of the B, E, F, and H are  $\frac{1}{8}$  stroke above the center of the letter. The top of vertical stroke of the G is  $\frac{2}{3}$  stroke above the center of the letter.

The letter J is terminated at its left extremity with a ball, or disk, the top of which reaches to the center of the letter, the small spur at the right extremity marking the intersection of the vertical stroke with the expanding curved fine line at a point  $\frac{1}{8}$  stroke above the bottom line. The fine line of the K intersects the vertical stroke at a point  $1\frac{1}{2}$  strokes above the bottom line, and the slanting stroke intersects the fine line  $1\frac{1}{2}$  strokes from the latter starting point.

62. The space within the lower part of the M is equally divided on the lower lettering line by the intersection of the

slanting stroke and the slanting fine line. The top of the vertical stroke is reduced one-fourth its width where the fine line bevels its corner. The main point to be observed in this letter is to be sure that the intersection of the vertical fine line and slanting stroke, and of the vertical stroke and slanting fine line, are the same distance from the top of the letter. The N is  $\frac{1}{2}$  stroke narrower than the other letters. The intersection of its slanting stroke and left fine line are the same distance from the top line as in the letter M. The ellipses that form the interiors of the letters O and Q are 1 stroke narrower than that of the C, owing to the fact that a heavy crescent-shaped stroke on either side of the ellipse so increases the letter as to give it proper proportions. The exterior outlines of the O and Q are perfect circles. The lower fine line of the letter P is  $1\frac{1}{2}$  strokes from the bottom line. The tail of the R is located  $\frac{1}{2}$  stroke to the left of the right outline of the letter, and is a perfect cyma equally divided by a horizontal line one-fourth the height of the letter. The crescent above it is 1 stroke wide at a point 1 stroke from the top line. The middle bar is located exactly in the center of the letter.

**63.** A center vertical line through the letter S will divide the stroke  $1\frac{1}{2}$  strokes above the bottom line. The finish of the left spur is vertically under the curve of the stroke above, but the finish of the right spur is  $\frac{1}{2}$  stroke within the letter, and but two-thirds the length of the lower spur on the side. The letter U is drawn with the lower inside curve a semiellipse, and an increase in the thickness of the spur marks the point where the vertical fine line becomes tangent to the curve. The W is  $6\frac{1}{2}$  strokes wide, its lower points being 3 strokes apart, 1 stroke to the right and 2 strokes to the left of a point vertically opposite the middle point on the top line, which divides equally the space between the inside of the left slanting stroke and the right fine line. The intersection of the stroke and fine line of the X is practically in the center of the letter, so as to make the enclosed triangles of equal area above and below. The fine line of the

Y intersects the vertical stroke exactly in the center of the letter. The character & possesses, for its heaviest stroke, a compound curve, the inclination of which is the same as the slanting stroke of the letter N. The width of this character on top is 3 strokes, and its lower portion projects  $\frac{1}{2}$  stroke to the left of the upper portion. The intersection of the right fine line and heavy stroke is  $1\frac{1}{2}$  strokes above the bottom line, and the top of the ball terminating the fine line is  $2\frac{2}{5}$  strokes above the bottom line and  $1\frac{1}{2}$  strokes to the right of the point of intersection. The light strokes of the character are about  $\frac{2}{5}$  the width of the heavy stroke.

**64.** The lower stroke of the numeral 2 is a perfect cyma, and the top is precisely the same as that of the 3. The stroke tapers off again to a fine line where it joins the left end of the cyma. The balls terminating the fine lines of the Roman figures are  $\frac{2}{5}$  stroke wider than the straight strokes of the figures, while the curved strokes of all the figures are  $\frac{1}{5}$  wider than the straight ones. The space between the two balls at the end of the fine line of the figure 3 is about one-half their diameter. The top of the figure 4 is finished in the same manner as the right stroke of the letter M. The horizontal fine line of the 4 extends  $2\frac{1}{5}$  strokes to the left and 1 stroke to the right of the vertical stroke, and is  $1\frac{1}{2}$  strokes above the bottom line. The horizontal stroke of the figures 5 and 7 is different from that of any other alphabet, and consists of a double compound curve, the concave and convex portions of which are opposite each other. The lower portion of the 5 is similar to the 3, and the vertical fine line is  $\frac{2}{5}$  stroke to the right of the left outline of the ball. The width of the lower stroke of the 7, on the bottom line, is  $1\frac{1}{2}$  strokes, and rests on the bottom line 1 stroke to the right of the end of the horizontal stroke. The top line of the lower portion of figure 6 is  $2\frac{2}{5}$  strokes above the bottom line. The ball is about  $\frac{1}{5}$  stroke within the figure. The stroke of figure 8 is precisely the same as that of the letter S, the fine line being reduced where it is brought around and intersects the stroke

near the center of the figure. The maximum thickness of the lighter stroke in the 8 is about one-half that of the main stroke. The figure 9 is a reversed 6, except that the ball extends to the outside line of the letter.

**65.** The New York Roman letter is used largely by some sign painters where the work is to be done in gold or in black letters on a white ground, and the fine line is so



FIG. 1



FIG. 2

thin that a strong contrast is required to bring it into prominence. Some designers vary the forms of the figures 2, 3, and 6 in a manner that, though not strictly classical, adds highly

to the effect. Instead of terminating the upper fine line with a ball, it is finished in a point, as shown in Fig. 1, or sometimes equal in width to the stroke, as shown in Fig. 2.

Draw these letters as on the previous plates, being careful to space the letters in the top line uniformly, and making the letters in the three lower lines of the plate proportionately; then place the date, name, and class letters and number in their proper places.

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#### PLATE, TITLE: ROMAN (BOSTON)

**66.** The Boston Roman letter possesses a much heavier fine line than does the New York Roman, the spurs of the letters being cut off on the end to form a fillet the thickness of a fine line. These spurs are one-fourth circle, as described in the previous plate, the radius being the additional width of the fine line nearer the center of the letter. In the earlier form of the Boston Roman (the style from which our present style sprung), the fine line was much longer on the spur, and triangular corners, instead of quarter circles, marked the connection of the spurs to the vertical strokes. The early form is now obsolete; only occasionally on a very old sign is seen an inscription making use of these letters. The application of this style of letter fills a

**68.** In the numerals, there is little change from the other style of Roman letter, except in the horizontal strokes of the 2, 5, and 7.

Draw this plate under the same rules and conditions observed in the previous plate, as all the proportions and details of the letters are identically the same, except where herein pointed out as different. Draw these letters as on the previous plate, inserting date, name, and class letters and number, as before, being careful to space the letters uniformly, and making the letters in the three lower lines of the plate proportionately.

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**PLATE, TITLE: MEDIEVAL ROMAN**

**69.** The **Medieval Roman letter**, termed by some authorities *Antique Roman*, belongs to the historic period that its name indicates. There are three features shown in this style of letter. The first of these is a small spur added above and below the lettering lines; another is a projection of the inside line of the stroke beyond the fine line a distance of about  $\frac{1}{8}$  stroke, as in the top of the letter A and the bottom of the N; and the third is the rounding of every angle of the letter where two fine lines or a fine line and a stroke intersect. The width of the stroke of these letters is  $\frac{1}{4}$  inch, or one-fifth the height. The spur is 1 stroke long, and is joined to the letter 1 stroke above the bottom, or below the top line, thus making the curve on the inside an exact quarter circle. All letters on this plate are 5 strokes in width, with the exception of such letters as have been heretofore described as always exceeding or falling short of these limits.

**70.** In the letter A, the fine line intersects the stroke at the point of the letter, and though the stroke on its inside is carried past the fine line, the intersection takes place precisely as though this peculiarity did not exist. The horizontal fine line of the A is  $1\frac{1}{4}$  strokes above the bottom of the letter. The lower curved portion of the B extends

MEDIEVAL ROMAN

A B C D E F G H I  
J K L M N O P Q R  
S T U V W X Y Z &  
1 2 3 4 5 6 7 8 9

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$\frac{1}{4}$  stroke beyond the upper curve, and the middle bar is  $2\frac{1}{4}$  strokes above the bottom line. The spurs of the C, G, and S, and of the numerals 1, 2, 3, 5, and 7, are finished with a fine line or secondary spur above or below the lettering line. In these three letters, this little spur is opposite the point of the main spur; it should not exceed  $\frac{1}{4}$  stroke in length, and is not vertical, although nearly so. The middle fine lines of E, F, and H, and the top of the vertical stroke of the G are  $2\frac{1}{4}$  strokes from the bottom line.

The letters E and F are  $\frac{1}{2}$  stroke narrower than the regular width of the letters. The L is one stroke narrower, the N  $\frac{1}{2}$  stroke narrower, the M 1 stroke wider, and the W is  $3\frac{1}{4}$  strokes wider than letters of regular width. The Y is  $\frac{1}{2}$  stroke, and the character & is 2 strokes wider than the average width of the letters. The vertical stroke of the letter G has a spur added at the point where the curved line and the bottom of the letter intersects with it. This spur is about  $\frac{1}{4}$  stroke in length. The letter J is  $4\frac{1}{2}$  strokes in width, and extends 1 stroke below the line, the ball being 1 stroke in diameter and crossing  $\frac{1}{3}$  stroke over the line. The curved portion is tangent to the ball of the left-hand portion, and intersects with the vertical stroke of the letter on the right side 1 stroke above the bottom line.

**71.** The K, like the letter A, has the inside of the slanting stroke projecting across its fine line; the intersection of the slanting stroke of the fine line is 2 strokes from the vertical stroke, and the fine line joins the vertical stroke  $1\frac{1}{4}$  strokes above the bottom. The spur on the end of the fine line of the L, as on all other horizontal fine lines of this alphabet, extends outwards as shown, though on this letter the incline is somewhat more than on the E, F, or T.

The slanting stroke and the fine line of the M intersect midway between the fine line and vertical stroke of the letter, both intersections of the fine line and stroke at the top of the letter being 1 stroke below the top line. The projection of the upper side of the slanting stroke on the right fine line of the N makes this letter the full width of 5 strokes.

The letters O and Q are circles on the outside, and the ellipses within, instead of being vertical, are inclined to the left, so that the longitudinal axis of the ellipse is about 1 stroke to the left on the top line.

The lower fine line of the letter P is  $2\frac{1}{4}$  strokes from the bottom line of the letter. The fine line of the R is  $2\frac{1}{2}$  strokes above. The tail of the R begins  $1\frac{1}{4}$  strokes from the vertical stroke of the letter and extends to twice this distance on the bottom line.

The spurs of the letter S are unequal in length, and the lower one is largely under the upper curve of the letter, while the upper one is  $\frac{1}{2}$  stroke within a line of the lower curve. The horizontal stroke of the letter is  $2\frac{1}{2}$  strokes from the bottom line.

The letter W is  $8\frac{1}{4}$  strokes wide on top and  $3\frac{3}{4}$  strokes wide on the bottom, and the intersection of the inside fine line and the right side of the stroke is 4 strokes from the left side of the letter. The interior triangles of the letter should all be of the same area.

The fine line of the X intersects the stroke  $\frac{1}{2}$  stroke above the center of the letter, and the fine line of the Y joins the stroke exactly in the center of the letter.

**72.** The character & is designed so that the interior of the upper and lower portions of the letter incline the same as the elliptical interior of the O and Q, and some authorities carry this feature in the inside line of the C and G, but it is difficult to accomplish this without producing a distorted appearance, and has therefore been here omitted. The top of the & is  $\frac{1}{2}$  stroke wide above the top line, and the right fine line expands to a width  $\frac{3}{4}$  stroke at a point almost on the top line. The fine line intersects the lower outline of the stroke half way between the top and bottom lines. The horizontal line of the spur is  $\frac{1}{2}$  stroke above the center of the letter.

**73.** The fine line forming the top of the numeral 1 is at an angle of about  $60^{\circ}$ , and the broadest point extends above the top lettering line about one-half the width of a stroke,

The fine line extending the width of a stroke beyond the vertical stroke of the letter. The curves of the 2, 3, and 5 are somewhat sickle shaped, the top of the 3 being the only one with a spur above the top line. The 3, 5, 6, and 9 terminate in a point 1 stroke above or below the line. This characteristic feature of the figures 3 and 4 in this style is the fine line, which is inclined at an angle of about 50°. The curved stroke of the 3 begins on the fine line at a point about  $\frac{1}{2}$  stroke above the center of the figure. The figure 4 extends 1 stroke below the bottom line, and the horizontal bar is 1 stroke above the bottom line,  $\frac{1}{4}$  stroke in thickness, and extends  $1\frac{1}{4}$  strokes to the right and  $3\frac{3}{4}$  strokes to the left of the horizontal stroke. The vertical fine line of the figure 5 is one-half the height of the letter.

The upper fine line of the figure 6 is  $\frac{1}{4}$  stroke below the top line. The slanting stroke of the figure 7 extends 1 stroke below the bottom line, and its lower right end is vertically below the center of the horizontal stroke of the figure on the top line.

The lower inside space of the figure 8 is made as large as possible, in conformity with the other letters of its style, the lower portion of the letter being 6 strokes in width and  $\frac{3}{4}$  stroke wider on each side than the upper portion. The horizontal portion of the stroke is  $2\frac{3}{4}$  strokes above the bottom line. The figure 9 is a reversed 6, the lower fine line being  $\frac{1}{4}$  stroke above the bottom line.

Execute all the work on this plate as in the previous plates, paying particular attention to the distinguishing characteristics of the letter, completing the plate with the date, name, and class letters and number in their proper places.

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#### PLATE, TITLE: LOWER-CASE ROMAN

**74.** The lower case of the four varieties of Roman letters are given on this plate, in order to show the comparative differences in their general design. The plate is divided somewhat differently from the previous ones, the lowest line being  $\frac{1}{2}$  inch above the lower border line.

Lower Case Roman

NEW YORK AND BOSTON: ROMAN

a b c d e f g h i j k l m n o p q r s t u  
a b c d e f g h i j k l m n o p q r s t u  
q w x y z

FRENCH ROMAN

a b c d e f g h i j k l m n o p q r s t u  
a b c d e f g h i j k l m n o p q r s t u  
q w x y z

ROMAN NUMERALS.

I II III IIII V V VI VII VIII IX X XI C D M

MEDIEVAL ROMAN

Another line drawn  $\frac{5}{8}$  inch above will mark the space for the first five letters of the alphabet. A similar  $\frac{3}{8}$ -inch space and line  $\frac{5}{8}$  inch above this will mark the first letters of the alphabet. The upper strokes of these letters extend  $\frac{3}{8}$  inch above this line, and  $\frac{1}{4}$ -inch space is left between their tops and the numerals.

The line containing the numerals is  $\frac{1}{2}$  inch high. Resting on the line forming the top of the Roman numerals are the first five letters of the French Roman alphabet. These are  $\frac{1}{2}$  inch high. Allow  $\frac{3}{8}$  inch space between lines of letters and above the upper French Roman letters  $\frac{5}{8}$  inch high. All letters above it, except the titles, are  $\frac{5}{8}$  inch high. The space between the top of the French Roman and the lower line of letters above is  $1\frac{3}{8}$  inches; the space between the upper letters  $\frac{5}{8}$  inch. The projection of the letters above the top, or below the bottom, lettering line is the same as in all three alphabets.

75. Only eight letters of the Boston Roman alphabet are shown, as this alphabet is practically the same as the New York style in every respect, excepting the proportionate widths of stroke and fine line, and any such other details as could arise from a difference of fine line and the way it finishes. These details have been explained in connection with a plate containing the capital letters in previous alphabets, and need not be repeated here. The bottom part of the vertical stroke of the a curves to a point in the New York alphabet, and finishes with a fillet at the end of a quarter circle in the Boston. The same difference will be observed in the finish of the vertical strokes of all letters in these two alphabets.

76. In the French Roman, this termination in the letters is different, branching off at an angle from the vertical stroke and carrying both sides parallel, making a spur on one side and a bevel on the other side of the stroke.

The curve of the a is the same in the New York and Boston alphabets, bending downwards to its intersection with the vertical stroke, while in the French Roman alphabet it intersects with the vertical stroke in an upward direction.

In the New York and Boston alphabets, the ball on the terminal of the upper fine line of the a and other letters is the same, but in the French Roman these letters are finished with a thickening of the fine line.

The width of the stroke in the first three alphabets is  $\frac{1}{8}$  inch, but that of the Medieval Roman is one-third less. The top stroke of the b, as well as that of all vertical strokes, except the t, in the New York and Boston alphabets, is horizontal, while the bottom stroke in each case is the reverse of the letter a.

The top of the c is the reverse of the top of the a; the letter d is the reverse of the b in each alphabet, except the Medieval Roman, the fine line of which intersects the stroke at the top of the body of the letter. The stroke of the e is cut off at a bevel in the first two alphabets, and brought to a point in the fine line in the lower two. The curved stroke of the latter is crescent-shaped.

The cross-line of the f in the first two alphabets is finished as a spur, but in the lower two it is a bar  $\frac{1}{2}$  stroke wide, extending two-thirds the width of the letter.

The letter g of the first alphabet extends four-fifths its height below the line. The top part of the g is equal to the o, and the bottom is a cyma, the right point of which continues in a fine line to the line below. The extreme lower portion of the g is the same in the first two and in the Medieval alphabet, except as to proportion, the latter being broader and more elongated, while the French alphabet differs in this respect by the omission of the return of the fine line.

There is little variety in the h, i, or j of any of the alphabets, except as to width and weight of the stroke. The tail of the r in the first two alphabets is practically the same; in the third, it forms a half cyma, but in the fourth one it meets the fine line, terminating in a ball. The s of the Medieval Roman alphabet thickens at the ends of the fine line, and terminates with a fine-line spur in the same manner as the capital letter of that alphabet.

The last five letters, with the exception of the y, are closely allied in design to the capitals of the same alphabet,

the letter y is similar to the letter v with its fine line carried below the bottom lettering line and finished as shown.

**77.** There are no set rules governing the width of the stroke, the space between the strokes in the Roman numerals always depending on the circumstances under which the characters are used. On a circle, such as a clock dial, the stroke is light and the space does not greatly exceed the line in this case. The numerals V and X are condensed as much as possible. The line at the top and bottom of the letter in many cases does not extend across the points of the V, as shown in the plate, but are cut off in the form of a spur for each individual numeral.

The numeral 4 in some cases is written IIII, and in others IV. There is no rule governing which shall be used, though custom has made the former almost universal in England. In nearly all cases where these letters occur to represent numerals, they are condensed much more than any other letters of the same style on the same tablet or in the same inscription.

In the use of the Medieval Roman alphabet, it was formerly customary to leave no space between the various words of the inscription, but to separate the words merely by a period, in the same manner as the numerals.

Draw this plate according to the directions given, proportioning the letters as directed, inserting the small titles over the alphabet, and observing particularly the characteristic differences existing in each one. After the plate is inked, enter the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner.

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#### PLATE, TITLE: COLOR SHADING

**78.** In shading letters with colors, there are several important points to observe. To give the shading the touch of a master hand, one must first select such colors as are in harmony or contrast. Discordant colors should, therefore, be studiously avoided. Weakness in coloring is always characteristic of the work of a beginner. Black or dark colors

should be freely employed to give strength to the shading. Pure rich colors may be easily destroyed by using a brush that has not been thoroughly cleaned, or they may be ruined by carelessness in mixing. This is especially true with regard to oil or varnish colors, as water colors are pure in their prepared state, and require only pure water to reduce them to the consistency and strength where they may be applied.

**79.** To draw the plate, use regular T. S. Co.'s cold-pressed drawing paper 15 inches by 20 inches. Measuring from the bottom edge of paper, draw the bottom line for the letter B exclusive of shade 3 inches from the edge; the letter C,  $2\frac{1}{4}$  inches, and the letter E,  $3\frac{1}{8}$  inches. The letter B is 2 inches from left edge of paper and  $3\frac{1}{4}$  inches wide, exclusive of spurs. The letter E is  $\frac{1}{4}$  inch from right edge of paper, and  $4\frac{1}{4}$  inches wide, exclusive of spurs. Locate the letter C  $3\frac{1}{8}$  inches to the left of E, making it 3 inches wide, extreme width. The widths of the strokes of these letters are: B,  $\frac{1}{8}$  inch, including black outline in each case; C is  $\frac{1}{4}$  inch, and E, 1 inch.

Beginning at the top edge of paper, measure downwards and draw a line for the top of title  $1\frac{7}{8}$  inches from edge. The height of title is  $\frac{5}{16}$  inch. Locate this in center of plate by finding center, which is 10 inches from right or left edge of paper. Locate the black panel containing the letter W  $1\frac{1}{4}$  inches from right edge of paper and  $2\frac{1}{4}$  inches from top; the height of panel is  $3\frac{1}{8}$  inches and the length  $4\frac{1}{8}$  inches. The height of letter W is  $2\frac{7}{16}$  inches and the letter is  $\frac{1}{4}$  inch from bottom edge of panel. The letter I is  $2\frac{1}{8}$  inches from top edge of paper;  $4\frac{5}{8}$  inches high and  $1\frac{1}{4}$  inches from left edge; exclusive of spurs. The letter E is  $2\frac{9}{16}$  inches from top edge;  $4\frac{1}{4}$  inches high, and 4 inches from left edge of paper. The panel to the back of letter E is  $2\frac{1}{8}$  inches from top,  $3\frac{1}{2}$  inches from left edge, 3 inches high, and  $3\frac{1}{8}$  inches wide. The letter S is  $2\frac{1}{8}$  inches from top edge of paper,  $8\frac{3}{16}$  inches from right edge, and  $8\frac{1}{8}$  inches from left edge measuring to the extreme curve of the main stroke of letter.

The letter T is  $3\frac{1}{4}$  inches high. The width of strokes is as follows: I,  $\frac{15}{16}$  inch; E,  $\frac{5}{8}$  inch; S, 1 inch; T,  $\frac{3}{4}$  inch, including black outline; W,  $\frac{9}{16}$  inch.

**80.** Draw the shade from all letters by first drawing light pencil lines from every point of the letter at an angle of  $45^{\circ}$ . Always keep the shade uniform in width and the space between the shade and the outline of letter likewise uniform in width. The space between the shade and the stroke in the letter W is  $\frac{1}{16}$  and the shade  $\frac{3}{8}$  inch wide, condensing this on left slanting strokes. The width of the yellow, crimson lake, and vermillion shades in the letter S is  $\frac{1}{4}$  inch; that of the two gray shades is  $\frac{3}{16}$  inch. The letter T being smaller, the width of shades are in proportion to the height of letter. The top portion of letter I is  $\frac{5}{16}$  inch on its black face and  $\frac{1}{16}$  inch wide in its bevels. The beveled edge of the lower portion is  $\frac{3}{16}$  inch. The strokes of the letter E are equally divided by a center line.

The width of the shades in the lower letters are as follows: B black shade next to letter,  $\frac{1}{4}$  inch; blended shade,  $\frac{3}{8}$  inch; black shade,  $\frac{3}{16}$  inch; dark-gray shade,  $\frac{3}{16}$  inch; and light-gray shade,  $\frac{1}{4}$  inch. C yellow, dark and light purple shades are  $\frac{1}{4}$  inch wide; and the natural shade beyond these,  $\frac{5}{16}$  inch wide. The shades of the letter E are all  $\frac{1}{4}$  inch, with the exception of the black, which are  $\frac{3}{16}$  inch and  $\frac{1}{8}$  inch, the wider being the nearer to the stroke of the letter.

Before coloring the face of the letters and shading them, use a soft eraser and reduce the pencil marks to visible lines only, entirely erasing any superfluous pencil marks and otherwise clean the drawing. It will impair the work to attempt this after the water colors have been applied. Execute all the black work of the plate before beginning to shade and color the letters.

**81.** Beginning at letter I, color the entire lower portion with a medium shade of Prussian blue. Lighten the blue with white for the light bevel and darken it for the dark bevel with the same blue. The yellow bevels of the top portion of the letter are an orange-chrome tint for the light,

darkened with burnt sienna for the darker bevel; for deepest shade, Indian red is used. The light-gray panel at back of letter E contains a little orange chrome yellow, while the gray shades of the letter are made of charcoal gray tempered with blue. More blue is added to this gray to produce the color used in blending the face of the letter S. The face of the letter T is sepia, burnt sienna, and charcoal gray. To shade the letters S and T, first run on the vermilion shade  $\frac{1}{2}$  inch wide and subsequently split this by covering the half nearest to the letter with crimson lake. Gold color may then be run in the space between the shade and the letter. The gold color of the letter W is made of orange chrome and lemon chrome yellow. The darker shade of yellow is the gold color with burnt sienna added. In coloring the W, cut in the letter with waterproof India ink, cutting in the shade also, then flow the water colors over the white, which insures a clear color.

To shade the three lower letters, begin on the B and outline the letter, then run on the heavy black shade next to the letter and the other black shade  $\frac{1}{2}$  inch from the first. The blending should then be done beginning with the lightest yellow, which is a tint of chrome yellow. Blend into this a little orange chrome, following with vermilion, then with the dark shade, which is the pure color, in the darkest part. The two gray shades are charcoal gray only. The tint on the face of the letter is made of Indian red. Use Mauve purple in shading the C, orange chrome yellow and burnt sienna for the shade nearest the letter, and charcoal gray and orange for the natural shade. The various shades of green in the letter E are obtained by adding gamboge to the new green for the yellow green, and Prussian blue for the blue green. Burnt sienna is used for the brown shade, orange and sienna for the shade within the face of the letter. The vine is Indian red with crimson lake added. Use gold color for outline of letter. Sufficient space is allowed at the bottom of this plate for the name, class letters and number in the right corner and the date of its completion in the left.

## PLATE, TITLE: GERMAN TEXT

82. The German Text is a style of letter originated toward the end of the Medieval period, and is closely allied to the Old English in many of its details. The identity of the letters themselves are somewhat more obscure than the Old English letters, as their general outlines are intended to conform more closely to the earlier styles. Some of the letters, such as the O, Q, S, etc., are scarcely recognizable as being the same characters with which we are familiar in the Roman type. This alphabet, like the Old English, is composed almost exclusively of combinations of cymas and crescents. The letters are not sufficiently regular to permit of a detailed description of each of their numerous proportions, and the student must use his judgment and measure by the eye to determine if the proportions of a letter are or are not in accordance with the plate. Draw the lower line of the lower-case letters  $\frac{5}{16}$  inch above the lower border line. Make the lower-case letters  $\frac{11}{16}$  inch high, with a space of  $\frac{1}{2}$  inch between the bottom line and the line for the long strokes above, which is  $\frac{5}{16}$  inch from the bottom of the upper line of letters. The long letters extend above the line  $\frac{5}{16}$  inch. Between the tops of the long letters and the bottom of the last line of capital letters is a space of  $\frac{3}{8}$  inch, and the capitals are 1 inch high and  $\frac{1}{2}$  inch apart. The title is  $\frac{9}{16}$  inch above the top line of letters, its capitals being  $\frac{7}{16}$  inch high, while its lower-case letters are  $\frac{5}{16}$  inch, or in the same proportion as the lower-case letters below in the plate. In this alphabet, the vertical strokes are  $\frac{5}{16}$  inch, and the curved strokes at the point of maximum width are  $\frac{1}{2}$  stroke wider. The vertical strokes of nearly all the letters in the capitals and lower case are cut at an angle of  $45^\circ$ , their bottoms terminating in two spurs on the sides, to which is added a fine line on the right end, while the fine line is added to the left at the top. The proportion of this may be more clearly seen by a reference to Fig. 3.

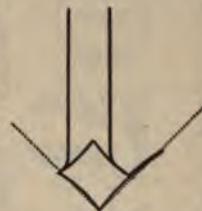


FIG. 3

German Text

Alles Gute und Segen  
Gott sei Euch  
Geschenkt  
Was auch immer  
Ihr auch nur  
Wünschen

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which shows the vertical stroke together with the diagonal stroke, showing the relative position of each if they were separated. At a of the lower-case letters is shown the characteristic of the vertical stroke terminating on the bottom line with its point to the right of the center of the stroke. It will be observed that the points of this stroke, to the fine lines extending from them, are but the angles of a small rectangle, the width of which is equal to the stroke and the length of which is equal to about  $1\frac{1}{4}$  strokes. This small rectangle is set with a point on the left of the center line of the stroke of the letter, diagonally opposite the point resting on the lower line of letters and its sides inclined at an angle of  $45^{\circ}$ . This rectangle is changed to suit the width of letter and the part with which it is to be united. In the lower case i and j, it is set with its principal angle on the center line of the stroke; in the p, it is set with its right angle on a line with the outside of the vertical stroke. This brings the projection of the stroke sufficient to the left to cause it to intersect with the vertical stroke on the left of the letter, when the upper left-hand angle is slightly extended. In the capital letter A, it will be observed that the cyma and crescent-shaped stroke, forming its upper left side, are both repeated in several letters, while either one or the other stroke is to be found in all of the letters. The width of these capital letters is about equal to their height, with the usual variation in letters that are always exceptions, such as the M, W, etc. The M and W are 50 per cent. wider than the other letters in both the upper and lower cases.

**83.** The principal thing in laying out this German Text is to give all the curved strokes the proper angle. Inaccuracy in proportion, either as to length or thickness, does not mar the appearance of the letter to such an extent as does the placing of the strokes at an improper angle. Many of the letters, when closely examined, will be found to be very much alike, and the stroke of the curved formations, once mastered, has only to be changed around and its size

altered to make it a simple matter to combine it in any of the letters. Draw the vertical stroke of the A  $\frac{1}{8}$  inch to the right of the left border line. Draw the slanting part of the stroke, with its point and spur, as above described. Construct the half cyma of a sufficient length to make the letter 5 strokes wide, and draw the vertical cyma and crescent stroke, the latter to within  $\frac{1}{8}$  stroke of the vertical and the former  $\frac{1}{8}$  stroke from the latter. The upper left strokes of the V are similar in outline, but different in proportion, to those of the A. A half cyma forms the lower right curve of the B, and a full cyma, terminating in a ball, forms the lower stroke of the B. A short thick cyma forms the top stroke of the letter and finishes at a point directly over the extreme outside curve of the lower portion. The C is in outline a crescent, within which is hung from the fine line a cyma, the bottom of which is continued in a fine line and curved parallel to, and  $\frac{1}{8}$  inch from, the lower stroke of the letter. The top of the letter is finished on the top line with a half cyma. The lower stroke of the D is similar to that of the B, but longer and thinner. It rests on the bottom line and swings around to the left again, similar to the stroke of the B, but continues past the vertical stroke at the top of the letter and curls up on the left side. The vertical stroke is then drawn as a cyma; its point pierces the top stroke, and its curved fine line is tangent to the bottom stroke. The letter E is similar to the C, except the addition of its ball and fine line. The letter F combines the two curves of the lower parts of two cymas, and is crossed at the top with a horizontal cyma, a ball and fine line similar to the E completing the characteristic of the letter. The left stroke and interior of the G is similar to the C, except that its interior cyma does not hang from the fine line, but crosses it, and its lower right fine line is continued around, deepening into a heavy semicycma, the inside line of which touches the vertical stroke and the top of which continues outwards and upwards, terminating in a ball at the top line. The letter H is composed of a vertical cyma, with a ball on its lower end and a semicycma on its upper end. The right stroke is a crescent, the left end of

which terminates in a small hollow-sided rectangle, 1 stroke in each direction.

84. The letters I and J, combined in one character here, are very similar to the F except that the lower strokes are much more inclined and there is no ball and fine line. In the letter K, the left-hand vertical stroke does not begin with a ball, but starts from a small rectangle, and curves, tangent to the lower line, into a fine line and thence into a broad stroke at its center, and diminishes at its top line, where it again becomes tangent and returns to the front of the letter as a part of the fine line. Under this fine-lined arch, which is  $\frac{1}{2}$  stroke above the line, is drawn a small semicyma; and under the semicyma are drawn the fine line and lower slanting stroke of the letter. The letter L is similar to the letter J reversed, but not quite so large. Its vertical cymas, too, are not inclined. The letter M is composed of the two crescent strokes terminating at the bottom in two semicymas, the points terminating below the line and finishing on the right side with a cyma and vertical stroke. The left stroke of the N is similar to the left stroke of the A, except that the crescent stroke is brought down full to the bottom line and the semicymas grow out of it to the left, as in the M.

85. The letter O combines the strokes of the letter D in a somewhat different manner. The vertical cyma inside the D is moved to the exterior edge, so that its center rests just to the right of the ball on the lower line. The right-hand top stroke is carried over, intersecting the vertical cyma at a point directly over the right-hand side of the ball of the lower stroke. The letter Q is precisely similar to this, except the tail. The letter P possesses a long vertical stroke, terminating below the line 2 strokes and tapering off to within one-third of its width at the center. The upper left half of this stroke is precisely the same as that in the N, the upper right half supporting a semicyma, the lower point of which is tangent to the end of a semicyma resting on the lower line. There is considerable similarity between the letter R and the letter K, though careful observation shows

that their details are entirely different in arrangement. The right lower stroke of the R is a vertical stroke terminating in a curve; the left stroke is a duplicate of the left stroke of the N, the difference being that where the vertical stroke intersects the top stroke the R reaches a horizontal line which extends from its vertical stroke to its crescent stroke while the N has no such detail. The stroke of the S is a horizontal cyma on top, a horizontal crescent at the bottom and a horizontal cyma of reversed curves in the middle. The characteristics of the strokes in the T are readily understood, but a strong resemblance would be observed in the general outline of the U and that of the A, and on this account many German printers use a letter identical with the lower-case u. The V is also similar to the B, except that its right stroke is a cyma supporting a small cyma, and its bottom stroke is a cyma attached to a ball. The letter W is very irregular. The upper left stroke is the upper left stroke of the A and the lower left stroke is the lower left stroke of the B. The vertical, or nearly vertical, intermediate stroke is joined to the crescent after terminating into a looped fine line; the extreme right stroke is a cyma supporting another cyma similar to the right half of the U, but of different proportions. The middle stroke is then proportioned to conform itself to these other two. The X is simply a vertical stroke crossed by a horizontal stroke. The Y is a combination of the left strokes of the U and A, with a vertical cyma and fine-line curve. The Z is composed of two crescents and a cyma, the middle stroke of which is 3 strokes above the lower line.

The character & is shown in two forms, the first one, composed of a vertical cyma, terminating in its upper end with a ball, and with two tangent cymas for its right stroke, being essentially the original German character, which is rarely used except in signs and inscriptions involving firm names essentially of a German character. The second & is a modification of the Old English form of the letter applied to this text for modern use in such places where the German text will be used to write English words or express English names.

and between the topmost line of the lower-case letters and bottom line of the capitals is  $\frac{5}{8}$  inch. The three lines of capitals are each 1 inch high and are spaced  $\frac{1}{2}$  inch apart. The title is  $\frac{5}{8}$  inch above the top line of letters, and its capitals are  $\frac{3}{4}$  inch high, while its lower-case letters are two-thirds this height. It is practically impossible, in an alphabet of this character, to give a direct proportion of the various parts of the letter in terms of its stroke and fine lines. The vertical strokes are  $\frac{5}{32}$  inch in width and  $\frac{1}{2}$  inch wider in all curved strokes. In manuscript and inscriptions, either painted or drawn, the fine line is usually as thin as it can be made. In carved work and stained-glass work the fine line is governed by the material in which it is executed. The widths of these letters vary largely, but, like many of the more geometrical alphabets, the average width is about equal to the height. The letters A, H, R, S, and T are each shown in two forms, the choice of which is left entirely to the tastes and desires of the letterer, as either style belongs to this alphabet. The stroke forming the upper right-hand finish of the B occurs in a more or less curved form in the letters H, N, O, P, Q, and R, and is a combination of cymas and semicymas. The cyma has been used in the other alphabets, but forms an actual component part of the letter in this, as well as in the Old English and German Texts, and forms one of the most important characteristics of the letter. It should therefore be practiced separately until its form is so familiar that it can be drawn in any position and in any direction.

**88.** In the first form of the letter A, the cyma occurs three times, and each time, with but one exception, in a different position. The stroke at the bottom of the B is a cyma, the terminals of which are continued, to form a fine line, and again spread into semicymas, constituting the lower curved portion of the letter. The heavy curved stroke of the C is crescent-shaped, its interior vertical stroke being another reproduction of the cyma. In drawing these letters, gauge carefully by the eye the space between the strokes and

also between the fine lines. The two vertical strokes of the B, and all other letters where vertical strokes are used together, are spaced about  $\frac{1}{4}$  stroke apart, whereas the vertical cyma, as it occurs in the C and G, is 1 stroke from the inside of the crescent stroke, and the vertical strokes inside the O and Q are spaced 1 stroke away from the point on the top line forming the outline of the letter. The lower finishing stroke of the D is similar to the B, whereas the upper stroke, starting at the left extremity of the letter, sweeps down as an elongated cyma and diminishes to a fine line at the same point as did the same detail in the B. The two points, or spikes, that project from the left of some of the letters are located about the middle of the vertical stroke, except in the A, where they are raised to clear the fine line. The vertical strokes from which they project, as well as the fine lines that extend from these strokes in some letters, such as the C and N, are beveled off top and bottom at an angle of about  $30^{\circ}$ .

89. All, except the curved lines of the letters, should be drawn with the triangle; those being at the  $30^{\circ}$  angle can thus be easily rendered parallel. The letter E is a combination of vertical strokes, cymas, and semicymas. The middle semicyma and the fine line that intersects it with the semicyma at the top, intersects the vertical stroke at the center. The lower stroke of the F carries this letter  $1\frac{1}{2}$  strokes below the line. The letter G is very similar to the C, except that the crescent forming its left stroke is vertical, and its right stroke is brought around and finished as a semicyma with like detail inside, as occurs on the bottom of F. The two styles of H are almost identical in their vertical strokes at top, the main difference being in the character of the curve that forms the right projection of the letter. The letters I and J are combined in one character in this alphabet, the vertical strokes of which are similar to the F, except that the right one finishes with a curve at the bottom instead of a straight line, as in the former letter. The K is similar to other letters in detail, except in its right strokes, one of which is a compound curve and the other straight, inclining to the

left at an angle of  $60^{\circ}$ . The lower stroke of the L finishes on one end with a curve, and on the other with a beveled and fine line at an angle of  $45^{\circ}$ . The vertical strokes are the same as those of similar letters, and two fine lines are attached to the horizontal stroke, which, with that of the T, by the way, are the only straight horizontal strokes in the entire alphabet.

90. The middle stroke of the M differs somewhat from the previous details of the alphabet, its upper end bending in full width to meet the fine line, while its lower end is finished with a spur on each side projecting  $\frac{1}{2}$  stroke, coming to a point at the bottom. The extreme right stroke of the M is a cyma. The right stroke of the N is similar to the stroke of the second H, but with less curvature. The O, P, Q, and R project  $\frac{1}{4}$  stroke above the top line, in the O and Q the point where this projection occurs being  $\frac{1}{2}$  stroke to the right of the center of the letter. This gives the exterior of the letter a pear shape; the left stroke forms a crescent, and the right one a compound curve, between which the vertical stroke intersects the top of the letter with one of the lower fine lines. There are no new details in the letter P, the stroke being simply a combination of the previous curves. The first variety of R resembles the B in its upper portion, and the K in its lower portion. The second variety possesses that peculiarity of twist at the upper end of its right vertical stroke that somewhat resembles the middle stroke of the M, and finishes like the top stroke of the D. The letter S will be found a difficult one to make; the fine lines of the second one and the lower part of the first one, being at an angle of  $45^{\circ}$ , may be drawn first and used as guides to proportion the letter. The letter in either of its forms is very similar; the first one is finished at the right of the half cyma with a ball, the lower fine line also terminating with a ball, somewhat after the manner of the Gothic style, though this and the T are the only two letters in the capitals of this alphabet that are so decorated. The first T is similar to the C in regard to its crescent stroke, while that of the second is carried its maximum width to the right, where it is cut off

with a fine line and ball. The right stroke of the U is the reverse of the middle stroke of the M. The V is a combination of cymas and straight strokes directly proportional, and the W is similar to the V in its right portion, with the addition of the vertical stroke on the left side. In drawing the X, make the compound-curved diagonal stroke first. Through its center draw the cyma. The fine lines will then intersect with the diagonal stroke at the angles between it and the cyma on the left-hand side, and are 1 stroke apart if carried parallel. The two strokes, or half cymas, of the Y are identically alike, and are spread apart sufficiently to make their two points 4 strokes apart on the top line. The crescent finish of the letter extends 3 strokes below the line. The diagonal stroke of the letter Z is at an angle of 45°. Its full length over the break is  $3\frac{1}{2}$  strokes. The break is 1 stroke wide on its inside, and the two fine lines intersect on the top line 2 strokes to the right of the diagonal stroke. The bottom of the letter, where the right point intersects with the bottom line, is directly below the corner of the lower side of the upper part of the diagonal stroke.

**91.** The stroke in the lower-case letters of this alphabet is the same as the vertical stroke of many of the capitals; the bottoms of the letters are in nearly every case terminate with two spurs extending to the right and left  $\frac{1}{4}$  stroke above the bottom line. These lower spurs vary slightly in the projections, according to the letter, and are either a full stroke or a half stroke, the difference being readily discernible at glance. The enclosed letters, such as a, b, and g, are 2 strokes wide on the inside. The letters m and w have their vertical strokes  $1\frac{3}{4}$  strokes apart. The letters r and x are precise alike, except the cross-bar of the x and curled terminal below the line. The letter t is crossed by a similar terminal, which extends from the upper line of the body of the letter to a point  $1\frac{1}{2}$  strokes below the line. There is nothing about this alphabet that should cause any difficulty in its execution. Close attention should be given to each individual letter, noting all its peculiarities before an attempt is made to draw

it. If your design of the letter appears in any way unlike the original, study the above, learn the point of error and correct it. In this letter, as in the previous alphabets, the curved strokes are somewhat heavier than the straight strokes, particularly the crescent-shaped strokes, the long compound-curved strokes not being so much so as the crescents, but at the same time heavier than the straight strokes. These variations are slight, but the fact that they exist must be noted in each case.

After drawing the plate, insert the title, as shown, place the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner.

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#### PLATE, TITLE: GOTHIC

**92.** The Gothic alphabet was created during the closing centuries of the Medieval period, and is associated historically, as well as in its outline, with the ogival, or pointed arch, which at this time existed in the Gothic architecture. The letter in modern use is applied to church decoration, for the purpose of writing religious quotations, and in printing certain kinds of church literature, for which it is appropriate on account of its origin in the ancient monasteries. It is more legible than the regular Church Text, and therefore more often used, both for church work and in the province of the commercial letterer. In dividing the plate with lettering lines, the bottom line of the lower-case letters is  $\frac{3}{8}$  inch above the lower margin line, and the height of the body of the lower-case letters is  $\frac{5}{8}$  inch; the stroke of the long letters extends  $\frac{1}{8}$  inch above and below the line. From the top line of the body of the lower-case letters to the bottom line of the numerals is  $\frac{5}{8}$  inch, and the numerals are  $\frac{13}{16}$  inch in height, with a space  $\frac{1}{2}$  inch between them and the lowest line of capitals. The capital letters are 1 inch high, with  $\frac{5}{8}$  inch between them, and the title is  $1\frac{7}{8}$  inch high; the lower case of the title is  $1\frac{3}{8}$  inch from the top margin line. The stroke of the letters in this alphabet is  $\frac{3}{16}$  inch, and the fine line is ~~stroke~~ stroke. The width of the letters average closely to

‡ Gothic ‡

A B C D E F G H I J  
K L M N O P Q R S  
T U V W X Y Z

1 2 3 4 5 6 7 8 9 0

ä å å å å å å å å å  
ä å å å å å å å å å

5 strokes, though there are many variations, owing to the eccentricities of outline. All the curved strokes of a letter are  $\frac{3}{4}$  stroke wider than the straight strokes. In the capital letters A, G, J, P, and T, and in the lower-case letters a, h, j, y, and z, there is a fine line terminating in a round ball at the end of the letter; the diameters of these balls being 1 stroke in the capital letters, and somewhat more than 1 stroke in the smaller letters.

**93.** In the letters A, E, and F, where a middle bar extends entirely through the width of the letter, this bar is  $\frac{1}{2}$  stroke. On the top line, the letter A measures 6 strokes in width between the small knobs, which are equal in thickness to the fine line. This horizontal fine line, at the top of the letter, extends only  $1\frac{1}{2}$  strokes to the right of the vertical stroke, and the curved line of the letter rounds out from the vertical stroke to a point 2 strokes distance at the horizontal bar, terminating in a ball  $1\frac{3}{4}$  strokes below the line. The vertical stroke of the A is 6 strokes from the border line, and between it and the B are 4 strokes. The vertical stroke of the B is but 4 strokes in length, and the fine lines curving from the center of the letter at the top and bottom line cut the ends of the stroke in a slanting direction, projecting beyond and terminating in a ball  $\frac{1}{2}$  stroke in diameter, the center of which is 1 stroke to the left of the letter. The inside space of the B, at the top, is  $2\frac{1}{2}$  strokes, the bottom is  $\frac{1}{4}$  stroke wider, and the points in the center of the curved strokes are  $1\frac{1}{2}$  strokes above the bottom, and below the top, lines. Between the B and C is a space of 2 strokes, and from the point of the C to its vertical fine line is  $5\frac{1}{2}$  strokes. The left half of the interior of the C is a semiellipse, and the curved fine lines, top and bottom, are thicker as they approach the vertical fine line and become nearly tangent on the inside. Between the fine line of the C and the stroke of the D is a space of  $3\frac{2}{3}$  strokes, and the latter letter is  $5\frac{1}{2}$  strokes wide in the center. The left half, including the stroke and its termination, is precisely the same as the left half of the letter B, and the right half the same as the letter

**C** reversed. The general outline of the **E** is a duplication of the **C**, except that the vertical fine line extends  $1\frac{1}{4}$  strokes above and below the letter, and terminates in small knobs the thickness of the fine line. The clear space between the **E** and the **F** is 4 strokes, and the vertical full stroke of the **F** is the same as that of the **A** reversed. The diminishing stroke on the right of the **F** can be readily recognized as an exaggerated spur, the origin of which has been seen in the previous alphabets. The inside of the letter is  $2\frac{1}{2}$  strokes wide at the horizontal fine line, which horizontal line is 2 strokes below the top of the letter. The width of the letter on the top line is  $6\frac{1}{2}$  strokes, and the finish below the bottom line is 1 stroke. The space between the **F** and **G**, at the intermediate horizontal line, is 2 strokes, and the left half of the **G** is constructed in the same manner as the left half of the **C**, while the right half is similar to the lower half of the **B**. The distance from the lower line to the top of the inside curve is  $3\frac{1}{2}$  strokes, and the greatest width of the letter from point to point is  $6\frac{1}{2}$  strokes.

**94.** Between the **G** and the **H** is two strokes, the vertical stroke of the latter being the same as that of the **F**, except as to its right finish on the top line. The curved stroke of the **H** makes the letter  $5\frac{1}{2}$  strokes wide and carries it 2 strokes below the bottom line. The letter **I** is  $3\frac{1}{2}$  strokes wide on the top and bottom lines, 3 strokes from the **H** at the point of the curved stroke of the **H**, and 2 strokes from the **J** on the top line. The letter **J** is  $4\frac{1}{2}$  strokes wide on the top line, and its upper horizontal stroke reaches its greatest thickness  $1\frac{1}{2}$  strokes from the left-hand end. The left-hand fine line, which is nearly vertical, terminates in a knob 3 strokes below the top line. The ball on the bottom of the **J** has its center on the bottom line and its left side directly under the end of the top horizontal stroke. The letter extends  $1\frac{1}{4}$  strokes below the line, is  $3\frac{1}{2}$  strokes wide on the bottom line, and its curved stroke at the intermediate point reaches a thickness of  $1\frac{1}{2}$  strokes,  $3\frac{1}{2}$  strokes below the top line. The vertical strokes of the letters **K**, **L**, **N**, **P**, and **R** are formed precisely

as the vertical strokes of the other letters, variations being made in their terminations, but those variations in no way differ from similar ones in letters on the top line. The upper left-hand finish of the P and R is precisely the same as that of the B; the lower horizontal stroke of the L is the same as the upper horizontal stroke of the J, except that the letter is  $5\frac{1}{2}$  strokes long. The curved stroke of the N is, in its lower portion, similar to that of the H, while its upper portion, where it joins the vertical stroke, is more like the D; the width of the letter at the center is  $5\frac{1}{2}$  strokes. The curved strokes of the K reach a point on the top and bottom lines that makes the letter 6 strokes wide. Their intersection and juncture with the vertical stroke takes place 3 strokes above the bottom line.

**95.** The letter M is  $8\frac{1}{2}$  strokes wide at the center, and about  $\frac{1}{2}$  stroke less at the bottom line. Its two points on the top line are about 3 strokes apart, and its right- and left-curved strokes are similar to those of the C, except that the enclosed ellipse is narrower. The middle stroke divides 1 stroke below the top line. The middle stroke of the letter at its center is 1 stroke wide, and the two interior ellipses are each 2 strokes wide. The letters O and Q are, in outline, a duplication of the left portion of the letter C, the tail of the Q being added, as shown, tangent to the center of the letter and extending to the right to within  $\frac{1}{2}$  stroke of the outside. These letters are 7 strokes wide. The curved stroke of the letter P projects from the vertical stroke sufficient to make the letter  $5\frac{1}{2}$  strokes wide, and extends below the top line 3 strokes. The upper part of the R is precisely similar, except that the ball on the interior is only the thickness of the fine line, in diameter, instead of the full stroke, as in the former letter. The tail of the R is nearly a straight line on its inside, with only enough curvature to prevent its becoming straight; this stroke is  $1\frac{1}{2}$  strokes wide, and its length between the lower ball, 1 stroke below the line, and the ball in the inside of the curve of the R is exactly 7 strokes.

**96.** The letter S is almost entirely included in a rectangle 7 strokes wide; the spur at the right-hand end on the top line extends to within  $\frac{1}{2}$  stroke of the corner of the rectangle, while the spur on the opposite end of the letter on the lower left-hand corner extends the full width of the rectangle. The point on the heavy curved stroke touches the right side of the rectangle  $1\frac{1}{2}$  strokes above the line, while the point on the left side of the rectangle comes within  $\frac{1}{2}$  stroke of the side, and is also  $1\frac{1}{2}$  strokes below the line. The letter T is similar to the letter G, except that both of its curved strokes are of smaller dimensions. The top of the intermediate fine line, as it curls into the letter, is 3 strokes above the lower line. The horizontal stroke at the top of the letter is  $5\frac{2}{3}$  strokes, and at its greatest thickness is 1 stroke wide. The intersection of the fine line of the body of the letter, with the crossing stroke at the top, is at the center of the letter. The letter U consists of a combination of the vertical stroke of the A and the curved stroke of the C, and is 6 strokes wide. The letter V is 7 strokes wide on the top line. The right slanting line of the V diminishes in width from a full stroke at the top to about  $\frac{1}{2}$  stroke at the bottom, where it joins the left slanting stroke. The W is 8 strokes wide on the top line and the right portion is the same as the letter U, which is  $5\frac{1}{2}$  strokes in width, to which is added a crescent-shaped curve and intersecting fine lines, this bringing the entire width of the letter up to 8 strokes. The letter X is  $7\frac{1}{2}$  strokes wide, and the intersection of its curved strokes with the slanting stroke is just above the center of the letter. The letter Y is 7 strokes wide at the top line, and consists in a combination of the left stroke of the V and the right stroke of the N. The top and bottom strokes of the Z are similar to the bottom stroke of the L. The letter is  $5\frac{1}{2}$  strokes wide. The spur on the bottom of the vertical stroke is 3 strokes long, while that on the top is  $2\frac{1}{2}$  strokes long.

**97.** In the numerals, the strokes are but  $\frac{1}{8}$  inch in thickness, in the straight characters, but extend to twice this thickness in the widest part of the curves. The top corners

of the 3, 4, 5, and 7 extend slightly above the line, as do also the lower corners of the 2 and 7, as well as the spur on the end of the 1 and 4. The curves forming the sides of the 3, 5, 6, 9, and 0 are similar to the curves forming component parts of the capital letters. The bottom stroke of the 2, the upper stroke of the 3, the left stroke of the 4, and tops of the 5 and 7 are each a semicyma. The horizontal fine line of the 4 extends 4 strokes to the left and  $1\frac{1}{4}$  strokes to the right of the vertical stroke, the width of the stroke of the numerals being used for measurement. The intermediate stroke of the 5 is 4 strokes above the bottom line; of the 6,  $4\frac{1}{2}$  strokes above the bottom line; of the 8,  $3\frac{1}{2}$  strokes above the bottom line; while the 9 is  $2\frac{1}{2}$  strokes above the bottom line.

The stroke of the lower-case letters is  $\frac{3}{2}$  inch wide. The width of all letters, except the w and m and the single-stroke letters, is  $4\frac{1}{2}$  strokes. The spurs forming the terminations of the strokes, at the top and bottom of the letters, are carried from the center of the stroke on the top and bottom lines, either way, to a point about  $\frac{1}{4}$  stroke from the line and  $\frac{1}{2}$  stroke from the vertical stroke, and are given a slight curve to these points. The student should be able to design the other details of this lower-case alphabet from the general proportions of the original plate, being careful, if necessary, to measure each detail in the original, and proportion its length or thickness according to the stroke of the letter.

After executing the work on this plate in pencil, ink it in, using the T square and triangle on the straight lines of the letters desired, and outlining all the curves and forming all the points on the curves of the strokes freehand, excepting the circles on the concave sides of the stroke of the capitals and numerals, which may be drawn with a compass if desired. The diameter of these little circles on the capital letters is  $\frac{1}{8}$  inch, and on the numerals three-fourths that of the capitals. The balls on the h, j, y, and z of the lower-case letters are two strokes in diameter. The ball on the lower-case a is but 1 stroke in diameter. After the plate is inked in and the titles put in place, insert the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner.

## PLATE, TITLE: SPENCERIAN SCRIPT

**98.** The term *script*, in its broadest and earliest application, included all styles of writing and printing, but custom has reduced the application of the term simply to that form of writing executed with the pen, which was formerly called *pen text* or *text hand*. The reduction to its present classification was caused more by the classifying of the other styles and leaving the term *script* to the pen text, rather than setting aside the pen text under the name of *script*, as was done with certain forms of early alphabets, such as the *Medieval* and *Church Text*. The earliest form of pen text was very simple in its construction, but it gradually grew complicated with the desire for elaborate lettering.

About the middle of the 19th century, the form of alphabet shown on this plate was originated by Spencer, and gave to the world an entirely new and artistic form of text hand. This is the form that is used almost exclusively by the letterer and sign painter, and for all practical purposes where a shaded letter and accurate form is desired. In drawing this plate, as before, outline all letters in pencil, forming the strokes of the capitals and small letters of two individual lines, and so inking them with a pen, but blacking them in afterwards with a No. 3 red-sable brush. In inking the lines, attention must be given not only to the formation of the curved fine lines and strokes, but also to the location and finish of these curves. When the letters are inked, it is of more importance to secure the proper position for each line than to be able to form the curves with evenness and perfection. Bear in mind that in executing this plate the letters are not to be written; it is not expected that any one of the strokes or curves made with a clean, even sweep of the hand will be perfect, but, on the contrary, every detail of every letter must be carefully located and drawn, in order that the finished character may be a reproduction of the one on the lettering plate.

**99.** In dividing the plate, make the bottom line of the figures  $\frac{1}{4}$  inch above the lower border line. Draw lines

The shaded stroke of the capitals should, in such letters as have the stroke shown in the A and L, be below the center of the letter, the maximum width of the stroke being at a point 1 stroke above the bottom line. While it is necessary to avoid the shading of all fine lines, there are cases, as in the letter E, where two shades are necessary in order to balance the letter and give it a more graceful appearance; but the shaded portion of a letter always represents the downward stroke of a pen or brush, and the shading of any of the upward fine lines would be in opposition to the characteristic formation of the letters.

Every stroke of these letters is based on a combination of the crescent and cyma.

In the lower-case letters, the maximum thickness of the stroke of a, d, g, o, and q is above the center of the letter.

In some alphabets, the tops of the letters formed similar to the a have their fine lines carried above the top line, as shown in Fig. 5, in which case the maximum width of the crescent stroke is above the center of the letter, and the general effect of the letter is oval. The points at the top of the r and s, and also the upper part of the loop of the k, extend above the top line. In executing the lower-case letters of the script in sign writing, one of the most difficult details is the joining of the fine lines and strokes in such letters as a, n, u, etc.

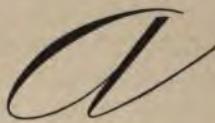


FIG. 5

**102.** In Fig. 6, the stroke of the letter is shown to be



FIG. 6

practically a straight line until it nears the top or bottom lines at the left or right, as shown at *a*, *a*, when it commences to curve and at the same time to diminish to a fine line, which finishes the top or bottom of

the stroke. This stroke and its accompanying fine lines, will be found to exist in the letters a, d, etc. In Fig. 6, the left stroke is practically the reverse of the letter i, while the wide

stroke is the other characteristic stroke that extends through the entire lower case. The dotted line through the center of the letter shows that the top and bottom of the stroke almost duplicates one of the other, and that the fine line, which curves to join the vertical stroke, joins it in exactly the center of the letter. Comparison of this detail with the letters h, m, n, etc. will show its application to the lower-case alphabet. The fine line should never intersect a stroke at a point above or below the center of the letter.

**103.** The two forms of strokes used in some of the capital letters are shown in the letters A and B. There are no rules governing which of these forms shall be used in the letters P, B, and R, under different conditions, this being left entirely to the taste of the letterer. The A stroke is used in P on this plate. The stroke shown in the letter A takes up a trifle less room than the one used in the B, and on that account is sometimes to be preferred.

**104.** Another variation of the capital letters, practiced by many expert letterers, is shown in Fig. 7, wherein the



FIG. 7

lower part of the C is carried below the line and the first lower-case letter of the word is inserted somewhat within the letter. This treatment is applicable to the letters C, E, K, L, and R, and may be used in some places where the space is limited and the

writing must be condensed, or to give an inscription a more graceful and freehand appearance.

**105.** Particular attention must be paid to the spacing of the inclined lines in the lower case. As said before, the proportions of strokes cannot well be given, but the horizontal width of most of the letters on a line through their centers will make them equal in this dimension to their

**height**, with the exceptions of the letters pointed out in **other** alphabets. Careful observations of this, and the **inclination** of the letter at an angle of  $35^\circ$ , causes little **trouble** in the finishing of work. A simple method of laying off **the** letters at the required angle is to make a small triangle of **cardboard**, one angle of which shall be  $35^\circ$ ; this may be **done** by taking a square card, and from one of its corners **measuring** off a distance of 4 inches; at right angles to this, **measure** off a distance of  $2\frac{1}{4}$  inches, and join the points so **sought** with a line on which the cardboard may afterwards be **cut**. The two angles opposite the long and short sides **adjacent** to the right angle will then measure  $55^\circ$  and  $35^\circ$ , respectively. After drawing the plate and inking it in, as **described**, insert the title in its proper place, place the date **in** **the** lower left-hand corner, and the name and class letters **and** **number** in the lower right-hand corner.

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#### PLATE, TITLE: ITALIC SCRIPT

**106.** The **Italic Script** may be generally characterized **as** a Roman letter, the strokes of which incline to the right at **an** angle of  $30^\circ$ , or occasionally to the left at an angle of  $20^\circ$ . It is a letter that, after practice, can be executed with great **rapidity**, and is of great value to both the plain letterer and the draftsman. The capital letters are almost identical with the New York Roman, excepting as to the finishing of the spur on the fine lines of the A, K, and V, and occasionally as to the letters M, N, W, and Y, when these are finished in the **same** **manner**. The tail of the R is sometimes dropped one-third of its length below the line, but in all other respects the rules governing the proportioning of the New York Roman letters will apply to these capitals. In drawing this plate, draw the line for the top of the numerals  $\frac{1}{8}$  inch above the lower border line and make the numerals  $\frac{1}{8}$  inch high. The lower-case letters are  $\frac{1}{8}$  inch high in the body of the letter and the first row of letters is  $\frac{9}{16}$  inch above the top line of the numerals. The five last letters of the alphabet are even with the top line that limits the height of the numerals.

*Italic Script*

*A B C D E F G H I J K L*  
*M N O P Q R S T U V*  
*W X Y Z &*  
*a b c d e f g h i j k l m n o p q r s t u v*  
*1 2 3 4 5 w x y z z 6 7 8 9 0*

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**107.** The long letters of the lower case extends  $\frac{1}{2}$  inch above and below the bodies of the letters, and the space from the top of the long letters and the first line of capitals above them is  $\frac{5}{16}$  inch. The capitals are 1 inch high and  $\frac{3}{4}$  inch between each line. The long letters and capitals of the title are  $\frac{7}{16}$  inch high and  $\frac{9}{16}$  inch above the top line of letters. The proportion of the capitals and lower-case letters in the title is the same as those in the body of the plate. Draw the capital letters, as shown on this plate, spacing them by the judgment of the eye and proportioning them according to the rules laid down in the plate for New York Roman letters. The lower-case letters have a  $\frac{3}{16}$ -inch stroke and average about 5 strokes in width, with the variation heretofore pointed out in other alphabets.

The tops of all the long letters are finished with a fine line and curved, as are also the tops of such small letters as i, m, and n. The letter f is reduced to a fine line and finished with a ball similar to the top of the letter c, the fine line appearing above the ball again as though a continuation of its outline.

The bottom of the letter has an oval form, finishing with a small ball similar to the bottom of the letter g. Where the letters ff occur in the middle of the word, the first reaches only to the bottom line of the regular letters and is given a slight curve and cut-off at the bottom, in the same manner as the letter p in this alphabet. The second letter f is then drawn as the one on the plate, its curved lower portion extending under the first one and the cross-line, or horizontal fine line, made continuous with the two letters, as shown in Fig. 8. The letters j and y are finished with a loop below the line, as in the ordinary script, the size of the loops varying slightly, according to the letter adjacent to them. The p and q are carried below the line with a full width of stroke, which is finished horizontally, though on the q the fine line is returned



FIG. 8

to the lettering line to distinguish it from the *g*. Either of the two forms of *s* and *z* shown in this plate is admissible in ordinary Italic lettering. The first form of the letter *s* is the one usually made where there is much lettering to be done, as its form is simpler and it can be made quicker. The same rule applies to the second form of the letter *z*. Where two *s*'s occur at the end of a word, the first form is used and the first letter made a trifle smaller, its top reaching only to the top line of letters. The second, however, reaches above the line, as is shown on the plate.

**108.** The numerals in this style of letter are precisely the same as those in the New York Roman, their width being equal to their height. Should it be desired to lay out these letters by means of guide lines other than those for the tops of the letters, proportion them in the same manner as the letters of the New York Roman plate, drawing such horizontal lines through the letters as may be necessary to locate their essential characteristics, and spacing what would be the vertical lines in the New York strokes at an angle of 30° from the perpendicular for this plate. After drawing the letters, figures, and title, the student will black them in, as shown, inserting the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner.

#### PLATE, TITLE: RENAISSANCE

**109.** Renaissance letters are of a great variety, the genuine characteristic of most of them being a lack of purity of style. The period of the invention of their design was about the middle of the 15th century, when great advancement was made in all art and architectural forms, and the discovery of ancient manuscripts and illuminated letters, embellished with classical ornaments, caused a divergence in the customs and styles in practice up to that time. In the capital letters of this plate are shown the style of Renaissance alphabet prevailing in Germany and its dependencies; it is known as the German Renaissance. The origin of the letter will be found in Italian writings, the Germans at this

**stroke** of the German. These points may be studied throughout the alphabet, and are too evident to require individual explanation. The letters of the Bradley text in the lower case, are as follows: 2-4-5-7-9-10-12-13-16-17-19-21-22-24-26-27-29-30-32-33-35-37-38. The three letters omitted are the i and j, which are made heavier than the German and dotted with a ball instead of a cyma, and the w, which is but two v's joined together. In drawing this plate, locate the bottom line of the lower-case letters  $\frac{3}{8}$  inch from the margin line, the lower-case letters being  $\frac{9}{16}$  inch high. The long strokes of the letters reach  $\frac{3}{8}$  inch above or below the line, and their stroke in both alphabets is  $\frac{3}{2}$  inch. From the body of the lower-case letters to the bottom line of the last row of capitals is a space of  $\frac{1}{2}$  inch, the French and Bradley text capitals being  $\frac{3}{4}$  inch high. The German letters are 1 inch high, exclusive of line work, with a space of  $\frac{5}{8}$  inch between each line of letters.

**111.** The ornamental work behind the German letters is not an essential part of the letter, but is shown here simply as a background that is usually applied when the lettering is used, in order to set it off and make it appear more rational. The lines of this background work radiate, in most cases, from the same central point, following very closely the stroke of the letter that is nearest them and spreading off outside of the letter a comparatively uniform distance from it, but preserving the identity of its general shape. In designing this plate, work almost entirely from observation of the details of the original letter. It is impossible to give any direct information toward the comparative heights or different details, or the amount of projection of each letter above or below the line. In following the design of this plate, use your ingenuity, measuring such details of the original with the compasses, and transferring their proportions to your plate, as you may consider necessary and would be compelled to do were you designing an inscription in this style of letter. Experience, by this time, with previous plates, should enable you to handle the pencil, pen, and brush with sufficient

dexterity to execute all that is required without further preliminary instruction. The date should be inserted in the lower left-hand corner as usual, and the name and class letters and number in their proper places.

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**PLATE, TITLE: SHIPPERS' BOX MARKING**

**112.** The letter entitled **Shippers' Box Marking** is used largely by shipping clerks for marking packages and boxes, and is executed almost entirely with a brush. Occasionally, for some purposes, the same letter is used on drawings or price tickets, where a similar letter is designed with a pen. The stroke of the letter is the natural swell made by the drawing of the brush as it is pressed down on the marked surface, charged with the marking fluid.

**113.** Two styles of brush are used for the marking of boxes. One, a soft camel's-hair brush with short hair, for marking the planed wood and smooth surfaces, while for rough wood and other irregular surfaces, a long-hair bristle brush is used. These brushes, when not in use, are usually allowed to stand in the marking pot, but in such a manner as not to rest on their points. In executing this plate, make the lower-case letters  $\frac{5}{8}$  inch high, and  $1\frac{9}{16}$  inch above the lower margin line, leaving a space of  $1\frac{1}{16}$  inches between the tops of the lower-case letters and the under side of the numerals and last letters of the alphabet. Draw the numerals  $\frac{7}{8}$  inch high, and the capital letters  $1\frac{1}{8}$  inches high. The space between the lines of capital letters is  $\frac{7}{8}$  inch. The capitals of the title are  $\frac{3}{4}$  inch high, the small letters  $1\frac{3}{16}$  inch, and are  $\frac{1}{2}$  inch above the top line of letters. Although there is no specific proportion for the width of these letters, the capitals average about 1 inch in width, and the lower-case letters about  $\frac{1}{2}$  inch.

**114.** The majority of the letters of the alphabet have for the right side of the stroke a straight line, the exceptions being in the J, where the straight line is on the left of the stroke, and in the M, N, V, and W, where both sides of

**115.** The long strokes of the lower-case letters, as they extend above the line, are given a slight curve to the left and finished with a short horizontal fine line: The bottom of the letters, however, is never finished with this fine line, in most cases being finished below the line with a scroll and ball, that of the *j* being somewhat similar to the lower part of the capital *J*, and the *p* and *q* finished plain, or with a fine-line flourish, as shown. When *ff* occurs in the middle of a word, the first letter reaches only to the lower line, and the other one is carried down to finish with a scroll and ball. A fine cross-line engages both letters.

At the end of a word, the letter *d*, shown on the plate with a looped finish above the line, is sometimes used, and although the first *d* is often used in a similar position, the second one is never used in the middle of a word. The letter *t* may be crossed with a straight line, or with a compound curve as in the copy. Do not execute these letters on the plate with a brush, though it is not likely that occasion will ever arise in practical work where you will be called on to execute them as large as this with a pen, but, in reproducing this plate, draw the letters in outline with a pen, as in previous cases, blacken them in with a brush, and send the plate in for correction. The object of this is to insure familiarity with the forms of the letters of this alphabet, so that in any subsequent practice you may not be handicapped in the endeavor to form a style of letter that is not well adapted to the use of the marking brush.

After completing the plate, insert the title, as shown, put the date in the lower left-hand corner and name and class letters and number in the lower right-hand corner, as heretofore.

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PLATE, TITLE: OLD ENGLISH

*Gotic*

**116.** This lettering plate, the modern form of the **Old English** letter, is far different from the alphabet bearing this name in its original use. The stroke is considerably heavier than the Church Text in proportion to the height of the letter, but varies in different letters to such an extent

Old English

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s

t u v w x y z

that it is almost impossible to give definite proportions of the letter in terms of its stroke. The present form of the letter adheres more closely in outline to the letter characters we are in the habit of seeing in our every-day reading matter, and therefore it is much more legible than the antique style. In Fig. 9 are shown two letters, I and S, partaking of the characteristics of the original Old English style. The comparison of these styles with the I and S in the drawing plate will show scarcely sufficient resemblance to identify the characters shown in the figure as being the parent letters of this style. The principal application of the Old English letter is in ecclesiastical decorating and engraving. Occasionally, the letter is used singly, as in an initial letter, or forms the principle of an illuminated capital, as often seen in ecclesiastical literature.



FIG. 9

**117.** To draw this plate, make the line governing the lower part of the body of the lower-case letters  $\frac{5}{16}$  inch above the lower border line; the lower-case letters are  $\frac{1}{8}$  inch high, with a space of  $\frac{9}{16}$  inch between them. The strokes of the letters extend, in some cases,  $\frac{5}{16}$  inch above or below the lettering lines, as indicated. Between the top of the lower-case letters and the bottom of the lower row of capitals leave a space of 1 inch. Make the capitals 1 inch high, and a space of  $\frac{1}{2}$  inch between each line. The title is  $\frac{5}{8}$  inch above the top line, and its capital letters are  $\frac{3}{8}$  inch high, the small letters being two-thirds this size. The characteristic features of the alphabet consist of a number of cymas, half cymas, and crescent-shaped strokes. The straight strokes, where used, usually terminate at one or both ends with a spur on each side about  $\frac{1}{2}$  stroke above the bottom line. The letters bear approximately the same proportion of width to height as did the Full Block letters, with the many variations necessary on account of their irregular form. The stroke of this letter is  $\frac{3}{16}$  inch, though

it is not uniform in all parts, the crescent strokes in ~~many~~ of the letters being  $\frac{1}{8}$  inch wider. Where two cymas are adjacent, or a cyma stands near the vertical stroke, one of the cymas is usually made  $\frac{1}{2}$  stroke wide at the thickest part; also, where a vertical stroke curves on the inside of the letter, as in the C, T, and U, the vertical stroke is a trifle less and the curved stroke is a trifle more in width than the full stroke.

118. In proportioning the letter A, draw the fine line from a point on the lower line  $2\frac{1}{2}$  strokes to the right of the left-hand border to a point  $5\frac{1}{2}$  strokes to the right on the top line. Then make the letter 5 strokes wide on the bottom line, and draw the fine horizontal line  $2\frac{1}{4}$  strokes above the bottom; the heavy horizontal line being  $\frac{1}{2}$  stroke in width, is drawn the thickness of the fine line below. The half cyma on the bottom of the fine line is  $2\frac{1}{2}$  strokes in length, measured from its point on the line, and the return of its fine line after curving 2 strokes below is directly under the point of the letter. The letter B is  $4\frac{1}{2}$  strokes in width to the outside of the cyma, exclusive of the spurs. The cyma, in its upper left-hand corner, is  $3\frac{1}{2}$  strokes in length, and its right-hand point is over the center of the fine lines on the interior of the letter. The right stroke of the B, where it joins the curved fine line, is thinned down to  $\frac{3}{8}$  stroke in width, and the upper stroke at this point curves around suddenly to form the fine line, terminating in a small ball. The crescent shape of the letter C is  $5\frac{1}{2}$  strokes wide from the point to its left-hand side, the upper end extending  $3\frac{1}{2}$  strokes to the right, and stopping over the center of the interior of the letter, the vertical stroke being  $2\frac{1}{2}$  strokes long and terminating with a half cyma, which measures  $1\frac{1}{2}$  strokes on the top line. The fine line joining the vertical stroke of the cyma and the bevel on the bottom of the vertical stroke, as well as all the diagonal lines at the ends of the letters in this alphabet, except as otherwise pointed out, inclines at an angle of  $30^{\circ}$ , but the line is not straight and always curves toward the interior of

the letter. The letter D is  $5\frac{1}{2}$  strokes in width to the outside of the spur of the cyma. The right vertical stroke and the top horizontal stroke are joined together at the angle by a sharp curve. The two fine lines in the center of the letter are  $\frac{1}{2}$  stroke apart and  $\frac{1}{4}$  stroke from the cyma. The letter E is composed entirely of cymas and half cymas. The space between the fine line and the first cyma of the letter is 1 stroke, between the fine line and the second cyma is  $\frac{1}{3}$  stroke, and between the right-hand fine line and the projecting end of the top of the letter is 2 strokes, which is directly over the half cyma on the bottom of the line, exclusive of fine-line projection; the middle half cyma projects from the fine line  $1\frac{1}{2}$  strokes. The F is drawn similar to the B, except that its middle stroke is finished like the E and its top stroke like the C. The G also resembles the C strongly, being precisely the same as that letter, with the exception of the right stroke, which is carried around and finished, as shown, coming to a point 3 strokes above the lower line; the lower corresponding point is 1 stroke above.

**119.** From the vertical stroke of the letter H to its fine line is  $1\frac{2}{3}$  strokes, from the vertical stroke to the cyma is 2 strokes, and from the vertical line to the outside of the second cyma, exclusive of the spurs, is  $3\frac{1}{2}$  strokes. The horizontal line of the H is  $\frac{3}{4}$  stroke in width, and its top is 2 strokes from the top line. The letters I and J are similar to E in their upright cymas, the difference being in the position of the heavy and light cymas, which are reversed. These letters, as the H, terminate on the top line where they are joined to the fine lines. The single fine line on the letter J is  $\frac{1}{2}$  stroke to the right of the main cyma, which terminates in a heavy cyma at the bottom of the letter. The letter K is developed from the letter I, the slanting fine line leaving the vertical fine line of the letter at a point 2 strokes above the lower line, and intersecting the top line at a point  $2\frac{1}{2}$  strokes to the right of the fine line. The lower heavy stroke intersects the fine line at a point 1 stroke from the first double fine line. The letter L is similar to the letter E, with the middle stroke left out and

with the vertical cymas reversed, the heavy one being to the right. The left part of the letter M is similar to the letter I, and its middle and right portions consist of two vertical strokes, separated by a space of  $1\frac{1}{4}$  strokes and  $1\frac{1}{4}$  strokes from the heavy cyma. The fine lines within the letter are  $\frac{1}{4}$  stroke apart and  $\frac{1}{4}$  stroke away from the vertical cyma.

**120.** The letter N is  $3\frac{1}{2}$  strokes wide between its fine lines, the slanting stroke intersecting with the left fine line 1 stroke below the top. The letters O and Q are identical in every part, except as regards the tail of the latter. The left crescent-shaped stroke forms a semiellipse on its inside, and its outside is 3 strokes from the nearest inside fine line. The other side of the letter extends  $2\frac{1}{2}$  strokes beyond this fine line, and the inside vertical stroke is midway between the fine line and the crescent stroke of the letter. The letter P is similar in construction to the letter L, its main cyma being carried nearly to the top line and its right stroke carried  $\frac{1}{4}$  stroke above the line and to the right sufficiently to make the letter  $4\frac{1}{2}$  strokes wide. The vertical fine line of the letter falls from the point of intersection of the cyma and the right stroke. The left half of the R is similar to the I, though a trifle shorter; the upper right stroke is similar to that of the B, though care must be taken to keep the tail of this letter vertical and not confuse it with the slanting stroke of the K, although they may appear somewhat similar. In drawing S, the point at the lower portion of the letter, where the half cyma joins the fine line from the full cyma above, is exactly midway between the convex curves of the cymas forming the body of the letter. The half cyma extends  $3\frac{1}{2}$  strokes to the left of this point. The right cyma extends  $2\frac{1}{2}$  strokes to the right of this point, and its greatest convexity is  $2\frac{1}{2}$  strokes above the bottom line. The left cyma reaches its greatest convexity  $1\frac{1}{2}$  strokes below the top line. The space between the cymas is  $\frac{1}{4}$  stroke, the right one being a trifle less and the left one a trifle more than  $\frac{1}{4}$  stroke in width. The cyma at the top of the letter T is 5 strokes long; the inside vertical fine line is  $1\frac{1}{2}$  strokes from its right-hand

end. The inside vertical stroke is  $\frac{2}{3}$  stroke from the fine line and also 1 stroke from the crescent-shaped curve that forms the body of the letter, the right finish of this curve being directly under the end of the horizontal cyma at the top.

**121.** The crescent spur at the end of the letter U is somewhat distorted in shape, in order to admit the insertion of the interior stroke, which is 3 strokes long and  $\frac{3}{4}$  stroke from the crescent. The letter is finished on the right side with a vertical stroke, as shown, the entire width of the letter being  $4\frac{2}{3}$  strokes. The vertical strokes of the V make the letter 2 strokes wide inside, the point on the top line of the letter being on a line with the inside of the right vertical stroke. The extreme right and the extreme left strokes of the W are but slight modifications of the right and left strokes of the V. The middle stroke, however, is a plain straight stroke terminating as shown. In the letter X the space between the diagonal stroke and diagonal fine line, if both were carried through to the lettering lines, would be  $2\frac{2}{3}$  strokes on the top and  $3\frac{2}{3}$  strokes on the bottom. The intersection of the stroke and fine line is  $1\frac{1}{4}$  strokes below the top and  $2\frac{2}{3}$  strokes above the bottom. The cross-bar of the X is  $3\frac{1}{2}$  strokes long. The intersection of the fine line and vertical stroke of the Y is 3 strokes above the bottom line, and the width of the letter on the top line, if the fine line were carried through, would be 4 strokes, the vertical stroke being in the center of this width. The strokes of the Z are modifications of similar strokes existing in the S, the half cyma at the bottom being  $4\frac{1}{2}$  strokes long in the bottom line, the diagonal cyma being drawn to finish with the former almost tangent at a point  $1\frac{1}{2}$  strokes from its left-hand end. The cyma on the top line does not reach to the left limits of the letter within 1 stroke, but is 3 strokes long, as it stops to the right side within  $\frac{1}{2}$  stroke of a vertical line drawn through the center of the ball and the end of the lower half cyma. The diagonal strokes of the character & incline at an angle of about  $35^\circ$ , the two upper strokes being 1 stroke apart, and the two lower strokes,  $1\frac{1}{2}$  strokes apart. The diagonal

strokes can be gauged by the eye and the character drawn in, as shown.

**122.** In drawing the lower-case letters, the interior space of all the enclosed letters is 2 strokes; the strokes of the small letters are  $\frac{1}{8}$  inch in width. In designing the small letters, draw all the vertical strokes first; then the diagonal fine lines that form the enclosures at the top and bottom of the letter are drawn at an angle of  $30^{\circ}$ . The spurs at the tops and bottoms of the vertical strokes are similar to those on the large letters and on the long strokes extending above or below the line. These spurs project  $\frac{1}{8}$  stroke to the right and left of all the vertical strokes, finishing on the top and bottom lines, with the exception of the right-hand strokes of the m and n, which terminate with a curve. The vertical stroke of the j is carried  $2\frac{1}{2}$  strokes below the line and is beveled off to the left in a curved stroke at an angle of  $60^{\circ}$  and terminates in a short and abrupt semicyma. A little study of this alphabet will show that there is a great similarity in the construction of all the letters of the lower-case alphabet. It is essentially a straight-line alphabet, there being only sufficient curved strokes to emphasize the characteristics of certain given letters.

**123.** In drawing this plate, give particular attention to the proportioning of the spacing of the letters on the plate, as well as to the drawing of the letters themselves. Owing to their irregularity in outline, no definite rules can be given as to the location of each individual letter, and as the alphabet is a difficult one and likely to require considerable practice before it can be satisfactorily done, each letter should be drawn on a separate piece of paper until you are familiar with it, and then redrawn carefully after its proper spacing has been located on the drawing paper. The first line of letters once properly spaced, the second and the third line can be located according to the relative position of their letters with those of the line above. It is not required that exactly the same proportion and spacing given in the original plate be maintained, but whatever spacing is adopted must

be uniform, so that the letters will not appear crowded in one part of the sheet nor spread apart in another, and that the spacing between the two ends of each line of letters and the vertical border lines shall be uniform.

After drawing the plate, insert the title at the top, put the date in the left-hand corner and the name and class letters and number in the lower right-hand corner.

#### PLATE, TITLE: ENGRAVING

124. The style of letter known as **Engrossing**, generally referred to as German Roundhand, is usually executed with a writing pen designed specifically for this purpose. It is more of a pen alphabet than a brush alphabet and but rarely enters into any of the work required by the sign painter and general letterer. It is largely used for the body of the information contained in engrossed resolutions or conventional forms, and before the invention of the typewriter was the letter exclusively used for engrossing wills, deeds, and other legal documents. In executing this plate, draw the letters in outline and fill in the strokes with a brush, but



FIG. 10

the characteristics of the construction of the letter should be understood in order that the stroke and its diminution to the fine line may be properly proportioned. The pens used by the draftsman to do this work are of two forms—one with a plain flat point like an ordinary stub pen, and the other style shown in Fig. 10, with which the shaded-letter alphabet is drawn. The latter style possesses a double point, which at one stroke draws both a heavy stroke and a fine line, as in the open-outlined letters and the shaded ones on the plate. In form, these pens are not unlike an ordinary stub, and are held in the hand, almost perpendicularly with the breadth of the

Engineering —

Q. A. B. C. D. E. F. G. H. J. K. L. M. N. O. P. R. S. T. U. V. W. X. Y. Z.  
12345 67890

Engineering —

Q. A. B. C. D. E. F. G. H. J. K. L. M. N. O. P. R. S. T. U. V. W. X. Y. Z.  
a b c d e f g h i j k l m n o p q r s t u v w x y z

Point, at an angle of about  $45^{\circ}$ . The position of the point of the pen is not changed in forming any of the letters, the direction of its movement determining entirely the width of each stroke, and the points of its taper or diminution to the fine line. In the letter A, for instance, the pen is set in position to draw the interior crescent stroke to the left of the vertical stroke of the A. The pen is then moved to the left of this crescent, and the upper crescent is drawn so that the terminals of each come together. The lower crescent of the A is then drawn as a continuation of the second one, thereby forming a curve somewhat like the letter C. The pen is again placed in position at the top of the second crescent, drawn vertically downwards within 1 stroke of the bottom line, and then in a slanting direction to the right, until it touches the bottom line, and then in the direction of the inclination of the point, upwards, making the terminal fine line. This operation, in varying forms, is repeated with every letter of the alphabet. Where the scroll curve occurs in any letter, each crescent or line of the curve is drawn separately, and terminated so that the fine end of one joins on to the fine end of another, except in the letter C, where at the top these lines are permitted to pass each other.

**125.** When the letterer desires to use this alphabet on a large scale, he usually outlines the letter, thickening the stroke and tapering it to a fine line in such places as would naturally occur if he were using a pen. The letters have no absolute proportions of width; they are based, in general, on the script alphabet, with a slight tendency toward the eccentricities of the German Text, but with sufficient latitude to enable the letterer to vary considerably in establishing proportions, without seriously impairing the symmetry and smoothness of the appearance of the work. In designing this plate, locate the bottom of the lowest line of letters  $\frac{1}{4}$  inch above the lower border line. Make this line of letters  $\frac{7}{16}$  inch high and leave  $\frac{3}{8}$  inch space between it and the line of shaded capitals. The top capital letters and numerals are  $\frac{3}{4}$  inch high, and the space between the shaded capitals and

the outlined letters above them is  $\frac{1}{2}$  inch, while between the outlined capitals and the lower-case letters in black above them, is  $\frac{1}{8}$  inch. The lower-case letters are  $\frac{1}{8}$  inch high and the space from them to the capitals is  $\frac{1}{4}$  inch. The two upper lines of capitals and numerals are  $\frac{1}{2}$  inch apart, and the title is  $\frac{1}{4}$  inch high and  $\frac{1}{8}$  inch above the top line of letters.

126. In drawing these letters use the freehand pen entirely, outlining the letters, and completing the plate in outline before starting to shade or blacken in any of the characters. The upper alphabets of capitals and lower-case letters may then be blacked in. One half of the second alphabet, and all of its lower-case letters may then be shaded, as shown on the plate, and the second half shaded and tinted with horizontal freehand lines, drawn about  $\frac{1}{2}$  inch apart. If desired, you may draw the letters with an engrossing or round writing pen, after you have had sufficient practice with this instrument on a separate sheet of paper. The width of the pen at the point should be  $\frac{1}{8}$  inch for the capital letters, and  $\frac{3}{16}$  inch for the small letters. This, when inclined at the angle of  $45^\circ$ , will give a stroke somewhat narrower than either of these measurements, which is the proper stroke, as shown on the plate. The main thing to be observed in letters of this plate is their characteristics, due entirely to the position of the pen, and the direction of its movement in their execution. The general proportion of each letter is more or less dependent on this; the amount of curve and the direction to be given each stroke will be determined by the position of the pen and the direction of the stroke.

After completing the pages shown, insert the date in the lower left-hand corner and the name and class letters and number in the lower right-hand corner.

## PLATE, TITLE: ARCHITECTS' PEN STROKE

**127.** This plate exhibits three forms of the **Pen Stroke alphabet** and their corresponding lower case, used under varying circumstances, but almost exclusively for architectural drawings. The letter is constructed so that it may be easily drawn without the use of any instrument save an ordinary pen or a drafting pen. The letters should be made perfectly clear and legible, expressing its words without study necessary on the part of the observer. The letters are free from any conventional proportion, there being no rule for stroke or width of letter other than those prescribed, according to the circumstances of each case. The stroke should usually be made heavier when drawn on tracing cloth, in order to produce a clear print, but in the lettering of the details of a paper drawing the stroke can be as fine as the draftsman may desire. The general proportions for the letters in alphabet No. 1 require that their width shall be four-fifths their height, while the width of alphabet No. 2 is equal to the height. In alphabet No. 3 the letters vary, the main purpose being to produce a letter by the use of the triangle and **T** square that can be completed in straight lines without freehand additions.

**128.** In drawing this plate, the lower-case letters of the alphabet at the bottom are  $\frac{1}{8}$  inch above the lower margin line. The letters are  $\frac{5}{16}$  inch high, and the long letters extend  $\frac{3}{16}$  inch above and  $\frac{1}{4}$  inch below the lines. The bottom line of capitals corresponding to this lower case is  $1\frac{3}{8}$  inches from the margin line. The letters are  $\frac{1}{2}$  inch high. The lower-case letters of alphabet No. 2 are 1 inch above these capitals, and are the same height, and extend the same distance above and below the line as do the other lower-case letters. From the second line of capitals to the lower-case letters of alphabet No. 1 is 1 inch, with a space of 1 inch between them and the capitals, and a space of  $\frac{1}{2}$  inch to the title, the capitals of which are  $\frac{3}{8}$  inch high. The capitals and the small letters, alphabets No. 1 and No. 2, are the same height as those in

Froblie's Penstroke

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b e d e f g h i j k l m — g & e = n o p q r s t u v w x y z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m — g & e = n o p q r s t u v w x y z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z & &

a b c d e f g h i j k l m n o p q r s t u v w x y z

the lower alphabet. The inclination of the letters in alphabet No. 1 is  $30^{\circ}$ .

**129.** The strokes of the letters are frequently projected beyond the limits of the normal letter, either as a scroll, such as occurs in the C and E, or as a compound curve, observed in the G and R. Wherever the scroll occurs, the end should be finished with a dot. The regular straight strokes of the letter are usually finished with a spur in the form of a short, straight line, which crosses the stroke at about an angle of  $30^{\circ}$  with the horizontal line. In some cases, the stroke of one letter is carried over to interfere with another, as may be observed in the tail of the Q, the middle stroke of the R, etc.

**130.** Occasionally, the initial letter will be extended to cover over or extend under an entire word, as shown in Fig. 11, but in the use of any such eccentricities, legibility, the chief object of the letter, must never be overlooked. While these conditions apply to all the alphabets, it is more particularly to No. 1 on this plate that we refer. Alphabet No. 2 is a modified form of the French Roman, without any distinction between the stroke and fine line. The spur should be very small, the tendency of the draftsman usually being to make it excessive. There are no spurs in the lower-case alphabet. Alphabet No. 3 is made entirely with the T square and the triangle, and requires no freehand penciling before laying it out.

**131.** The upper and lower lines confining the letters should be drawn first, the letter A located in its proper place

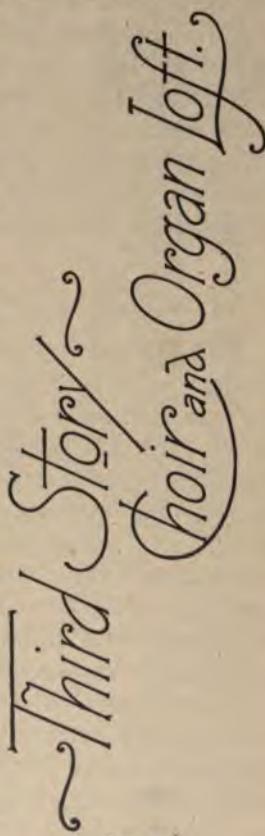


FIG. 11

and drawn in ink, and then, after approximately spacing the distances, the vertical lines of the letters B, C, D, E, etc. should be drawn in ink without further instructions.

When this plate is finished, make a careful comparison ~~of~~ each letter of your own plate with that of the copy, and endeavor to examine and detect for yourself any irregularities or errors that may exist. If this error is in the proportioning of the letter, correct it before your plate is sent in for correction; if it is simply an error of location or spacing, let it stand, and, unless very serious, it will not be counted. When satisfied that every detail is up to the standard, insert the date in the lower left-hand corner, and the name and class letters and numbers in the lower right-hand corner.

## PLATE. FIFTH: DRAFTSMEN'S STYLES

**A B C D E F G H I J K L M N O P Q R**

**A B C E**

**S T U V W X Y Z**

<sup>8</sup>  
Backhand. Pen Stroke Letter

**A B C D E F G H I J K L M N O P Q R**

**A B C E**

**S T U V W X Y Z**

<sup>9</sup>  
*Shaded Italic Script*

**A B C D E F G H I J K L M N O P Q R S T U V W X Y Z**

**a b c d e f g h i j k l m n o p q r s t u v w x y z**

67890

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in capitals and lower-case letters; etc. All of the principal letters used in this work, as well as several other styles, are given in this Course of instruction for draftsmen, but their specific application is a matter of separate study and does not form a part of this Course.

**133.** In drawing this plate of letters, draw the bottom line of numerals  $\frac{7}{16}$  inch high and resting on the lower border line. Between this and the letters above is a space of  $\frac{1}{8}$  inch, and the letters themselves are  $\frac{9}{16}$  inch high. The lower alphabet of lower-case letters is  $\frac{5}{16}$  inch below the capital letters of that alphabet, or about  $\frac{1}{8}$  inch above the bottom line, and  $\frac{5}{16}$  inch high.

The line of letters numbered 6 is  $\frac{3}{8}$  inch above the line numbered 7, the lower case of alphabet No. 5, to the left, being  $\frac{5}{16}$  inch high in the body of the letters, and the alphabet to the right,  $\frac{5}{16}$  inch high. From the top of the former to the letters in No. 5 is  $\frac{1}{8}$  inch, and the letters are  $\frac{7}{16}$  inch high. Above this, a distance of  $\frac{3}{8}$  inch, the heavy line containing the last eight letters of the alphabet is  $\frac{5}{16}$  inch high, and all the heavy lines above this are spaced  $\frac{1}{8}$  inch apart and  $\frac{5}{16}$  inch high. The four letters in lines 2 and 4 are  $\frac{3}{16}$  inch below the line immediately above them, while the small lines of letters numbered 8 and 9 are each  $\frac{1}{8}$  inch high, and located with their small letters in the center of the space occupied by the alphabet immediately to the left. The panel containing the title, the length of which is 5 inches, is  $\frac{1}{2}$  inch wide and  $\frac{1}{8}$  inch above the top line of letters. The height of the letters in the panel is  $\frac{1}{4}$  inch, the stroke is one-fifth their height, and the white outline border is 1 stroke in width. Beginning with the top line of letters, the stroke of which is one-fifth the height, locate the center of the top of the A 3 strokes from the left border line. The letters of this alphabet are all 5 strokes in width, except the L, which is only  $4\frac{1}{2}$  strokes; the M, which is 6 strokes; and the W, which is 7 strokes in width. It will be observed that this alphabet is very similar in many of its details to the Half Block alphabet drawn on the second plate, with two exceptions:

one, that the width of the letter is equal to its height, and the other, that the letters with beveled corners do not possess that bevel on the inside of the stroke. The first of these exceptions may be varied according to the conditions in which the lettering is to be done. Certain drawings may require that the letters shall be elongated or condensed, thus destroying the proportion of width to height; but the condition regarding the bevel existing on the outside of the letter only should never be altered, as omitting the bevel on the inside of small letters contributes to the sharpness and clearness of the outline, as may be seen in the letters of the title.

**134.** Alphabet No. 2 shows an alphabet, or at least a portion of it, the proportions and general outlines of which are similar to No. 1, with the addition of the spur, as in the Antique Half Block plate. No difficulty should be experienced in executing this alphabet, should it be desired, in any of your work, as the general principles of the letters are precisely the same as in alphabet No. 1. In designing the other letters, no spur should be placed on the left extremity of the J nor on the tail of the R, and the small spur that exists on some letters where the bevel stroke intersects with the vertical stroke should never exceed in size one-half the regular spur. No spurs on any of the letters should project above the line, except on the letters C, G, and S. Alphabet No. 3 is a repetition of the Egyptian letter already drawn in that plate, excepting in the letters having rounded strokes. The O and Q in this alphabet are perfect circles, while the strokes of the other rounded letters are all elliptic curves. The letters are somewhat similar in many respects to alphabet No. 1, the left extremity of the J, however, extending higher above the lower line, and the rounded letters, such as the C, G, O, etc., having their convex edges a little above and a little below the lettering line. This protuberance of the letter is only noticeable when horizontal lines are drawn limiting the top and bottom; but if it is not done, these letters will appear shorter than the

others when a line of lettering exists alone. Alphabet No. 4 is similar to the Antique Egyptian plate, and in this is embodied some features referred to in the previous alphabet. The spur is added precisely as in alphabet No. 2, excepting in the letters C and E, all letters of a similar character partaking of the same peculiarity.

**135.** Alphabet No. 5 is one of the most important alphabets with which the draftsman is required to be familiar. This style of letter is used in descriptive matter on all classes of drawings. It is a single pen-stroke letter drawn rapidly, freehand, and when executed at a uniform angle and properly spaced, presents a line of very neat work. The principles on which these letters are constructed are shown in the oval of Fig. 13, and the characteristic curve by which

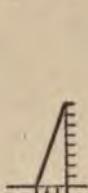


FIG. 12

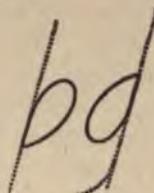


FIG. 13

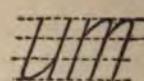


FIG. 14

such letters as the m and u are joined is shown in Fig. 14. The angle of these letters is three parts base to eight of height, as shown in Fig. 12. The round letters of the lower case, which are shown to the left of alphabet No. 6, are not elliptic, but oval, and the curve should be practiced repeatedly before executing the plate. If the capitals of alphabet No. 5 are drawn perpendicular, instead of at the angle shown in Fig. 12, then the lower-case letters shown to the right of those belonging to alphabet No. 5 will be used. These lower-case letters, alphabet No. 6, are elongated, and made to fill a space often occurring in drawings, which is too narrow for the regular proportion, as shown in the line above. When this style is used, the capitals and long letters of the lower alphabet should be twice the height of the small letters of the lower alphabet.

**136.** Alphabet No. 7 is an engrossing alphabet, or, as it is sometimes called, Round Writing, and is made with a shading pen especially designed for this writing, and used with ordinary writing fluid or India ink. The angle of the up stroke, or fine line, of the pen should be about  $45^{\circ}$ ; the heavy strokes should always be made with a downward movement of the pen, and the fine lines either united or, as in the R and S, terminated with a slight space between the points. The letters in No. 8 are backhand pen-stroke letters, as indicated, and are used for similar purposes with alphabet No. 5, and can be executed with great rapidity where time in the lettering of a drawing is of importance. This letter must always be of uniform angle and somewhat condensed.

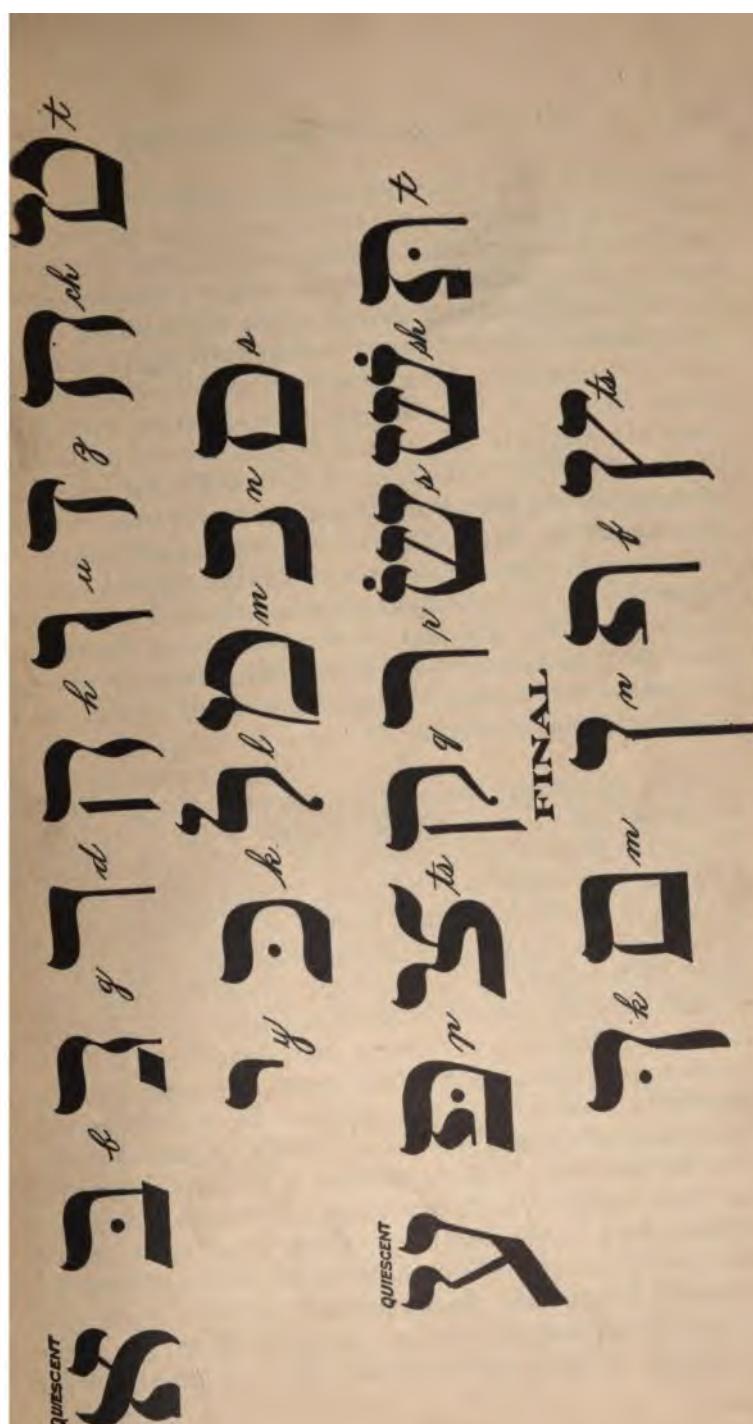
**137.** The shaded Italic Script shown in No. 9 is a letter in general use for important lettering of drawings, such as titles, etc., where it is especially beneficial in giving a variety and thereby improving the appearance of the drawing. The title of the drawing shows the letter treated in a different manner, but proportioned precisely the same as the other letters in alphabet No. 1. The letter is carefully outlined, as in the previous cases, and then the background is blacked in, leaving the letter in relief instead of blacking the letter itself. The shaded strokes of alphabet No. 7 and letters in No. 9 may be either outlined with a fine pen and blacked in subsequently, or they may be made with a single stroke of the fine soft pen, the strength of the line being altered by the pressure, or, in the case of alphabet No. 7, with a round writing pen previously described. Execute the plate as shown, paying particular attention to the spacing and proportioning of each of the strokes in each of the letters. There is nothing in this plate that is essentially new, but there is much in the arrangement, location, and proportioning of details that will test the attention given to, and the knowledge derived from, the work on previous plates. After the plate is completed, insert the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner, as usual.

## PLATE, TITLE: HEBREW

**138.** The Hebrew alphabet, though not considered until nearly the end of this Course, is, in point of chronology, the earliest form of letter with which we have so far had to deal. It is not the intention here to give instruction as to the sound represented or the names given to the different characters, but to familiarize one with the forms and principles that govern the different letters, so that he can execute the same from a rough copy, when required to design an inscription for the stone cutter, marble worker, metal worker, or the engrosser.

**139.** In executing this plate, locate the lower lettering line  $\frac{5}{16}$  inch above the lower margin, which gives the bottom of M only. Make these letters  $1\frac{1}{2}$  inches high throughout the alphabet, with a space of  $\frac{7}{8}$  inch between the two lower lines, and  $\frac{3}{4}$  inch between the upper lines. The title is  $\frac{3}{8}$  inch high, the word Final,  $\frac{3}{16}$  inch. The average width of the stroke of these letters is about  $\frac{1}{4}$  inch, and the fine line about  $\frac{1}{16}$  inch. The English characters, for which the letters stand, are marked by the side of them, and the following names in their regular order will show to which ones we refer to in the subsequent descriptions: *Aleph, Beth, Gimel, Daleth, He, Vav, Zayin, Cheth, Teth, Yod, Kaph, Lamedh, Mem, Nun, Samekh, Ayin, Pe, Tsadhe, Qoph, Resh, Shin, Tav.* The final letters are *Kaph, Mem, Nun, Pe, and Tsadhe.*

**140.** Some of these letters resemble each other so closely that the closest attention is necessary in order to distinguish the characteristic points. The cyma, which is the main stroke of the first letter Aleph, is more pronounced in this than in some other Hebrew alphabets, thus showing that there is opportunity for variation in this detail. The lower stroke of the second letter, corresponding with B, extends to the right of the fine line  $\frac{1}{4}$  stroke, while in the next letter, G, it is but  $1\frac{1}{2}$  strokes in length, and does not quite reach the fine line. The character corresponding to D and that corresponding to R are very similar, the distinguishing



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characteristic being that the former is carried almost to a point at its upper right-hand side, while the latter curves off to the fine line. The vertical stroke of the H does not reach to the cyma at the top of the letter. The letter Y is cut off short, finishing 2 strokes above the bottoms of the other letters. The dot inside the letters B, K, T, etc. must never be omitted, as the letter will not then possess its proper value. In the character corresponding with M, a space of  $\frac{1}{2}$  stroke is left between the fine line and the bottom horizontal stroke. The quiescent Ayin somewhat resembles the letter Y, and the tail of the letter extends from the bottom line, at an angle of about  $60^{\circ}$ , to a point vertically under the top. The short stroke of the P is finished  $\frac{1}{2}$  stroke above the horizontal stroke, with a short fine-line spur toward the left. The dot of the letter rests on what is really the lettering line, which extends practically through the center of the letters, a characteristic in which this alphabet differs from all others.

**141.** In forming these letters, pay particular attention to the proportion of each, according to the width of its stroke. Notice the position of the cyma, with regard to the lettering lines, between which the characters are drawn, and also the location of other details, with respect to the horizontal lines, on which the script letters rest and below which the Hebrew letters, in nearly every case, extend. Note the combination of similar details existing in different letters, as was the case in the Old English and German text alphabets; the T, for instance, possessing, as its right stroke, the same character as stands for the letter R, the upper stroke of the B, and the right stroke of the final F. Note also that in general appearance the letters T, M, S, P, and final M are very much alike, but when analyzed, as to the shape and proportion of their strokes, are entirely different. On the other hand, observe that the character standing for Ts in the middle of a word is totally different from the character standing for the same letters at the end of a word. The only difference in the characters standing for S and Sh is the position of the dot.

Lay out this plate in outline as in the previous ones, black in the letters with a brush, and print in the title in a Roman letter  $\frac{5}{16}$  inch above the top line of the Hebrew letters. The word Final over the last line of Hebrew letters is  $\frac{5}{16}$  inch above them. After the completion of the plate, write the date in the lower left-hand corner and the name and the class letters and number in the lower right-hand corner.

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#### PLATE, TITLE: UNCIAL GREEK

142. The Uncial Greek alphabet is distinguished from the alphabet of minuscules in the same sense that capitals are distinguished from lower-case letters in the Roman alphabet. The minuscules, however, are not always used in the exact relation of lower-case letters to the Uncial Greek, nor are the latter used entirely as capitals. The uncial letter is always used at the beginning of proper names and the first word of a sentence, whether the whole sentence is written in this style letter or not.

143. In designing this plate, draw the line limiting the bottom of the letters  $\frac{1}{4}$  inch from the lower border line. The minuscules are then made  $\frac{3}{4}$  inch in height, with a space of  $\frac{3}{4}$  inch between them. From the top of the minuscules to the bottom of the uncial letters, a space of 1 inch is left. The uncial letters are 1 inch high, with a  $\frac{1}{2}$  inch space between them, and the title is  $\frac{1}{4}$  inch high and  $\frac{1}{2}$  inch above the top line.

144. There are but twenty-four letters in the Greek alphabet, and as their forms are in many respects different from the Roman letters, it is well to know them by name in their regular order, that proper comparisons with them and other alphabets can hereafter be made.

The names are as follows: *Alpha, Beta, Gamma, Delta, Epsilon, Zeta, Eta, Theta, Iota, Kappa, Lambda, Mu, Nu, Xi, Omicron, Pi, Rho, Sigma, Tau, Upsilon, Phi, Chi, Psi, Omega.*

The stroke in this form of letter is a trifle less than  $\frac{1}{4}$  inch wide; the general width of the letter is about 4 strokes,

UNCIAL GREEK

Α Β Γ Δ Ε Ζ Η Θ  
Ι Κ Λ Μ Ν Ε Ο Ω  
Π Σ Τ Υ Φ  
α β γ δ ε ζ η θ ι κ ν μ  
ν ξ ο π ρ σ τ υ φ χ ψ ω

Excepting round or extended letters, which are wider and can only be judged by their relative proportions. The average width of the minuscules is  $\frac{9}{16}$  inch, and their form can best be reproduced by drawing the lettering lines at the top and bottom of the letters on the plate, and judging the proportion of the Greek letter in the copy as it projects above or below this line.

**145.** The letters Alpha and Beta are similar to the Roman characters A and B, with the exception of the spur, which is  $\frac{1}{2}$  stroke in length and but  $\frac{1}{4}$  stroke in width where it joins the letter. There is no letter C, and the Gamma (G) is similar to an inverted L. The Delta (D) and Lambda (L) are similar in outline to the Alpha, except that the former has a horizontal stroke and the latter possesses no horizontal fine line. Epsilon is similar to the Roman letter E, and Zeta corresponds with the Roman letter Z. The Eta is very similar to the Roman letter H, but is the character used in the Greek for the long sound of the letter E. The Theta (Th) is similar in outline to the Omicron (O), except that it has a cross-bar in the middle, which is  $\frac{1}{2}$  stroke wide and reaches to within  $\frac{1}{4}$  stroke of the curved outline. The Iota and Kappa are similar to, and correspond with, the Roman letters I and K. There is no letter J in the Greek alphabet. Lambda, the equivalent of the Greek letter L, is similar to an inverted V, or an A without the horizontal fine line; and Mu and Nu correspond with, and are similar to, the Roman letters M and N. Xi, corresponding somewhat to the letter Z, is drawn with three horizontal strokes, the intermediate one being 1 stroke shorter on each end than the two outside strokes. Omicron, as said before, is similar to the letter O of the Roman alphabet. Pi is similar to the Eta, or the letter H, without the horizontal fine line. Rho, the Greek letter R, is identical with the Roman letter P, except as to the spurs. Sigma, the Greek letter S, is unlike, in its general appearance, anything in the Roman alphabet, but its slanting stroke and fine line are the same inclination as those of the X. Tau is similar to the Roman T. In the Greek,

Upsilon is the character that stands for the Roman letter Y, to which it is closely related in outline. Phi, Chi, Psi, and Omega, the last four letters of the Greek alphabet, correspond to Ph, Ch, Ps, and the long sound of O, respectively. The Phi is similar to a letter I passed through a low, broad ellipse; the Chi is similar to the Roman X. The Psi is a character entirely different from anything we have heretofore met, but its middle stroke is the same as the middle stroke of the Phi. The Omega in its upper half is similar to the O, but its lower portion is finished with horizontal strokes and spurs, as shown.

**146.** Among the minuscules, there is less resemblance to the Roman characters than we find in the uncial letters, and many letters that bear a resemblance to certain Roman characters do not correspond with those characters in sound. The Sigma is very similar to the Omicron, and closely resembles an inverted Q, totally different from the same character in the uncial alphabet, or to the letter S in the Roman alphabet, for which it stands. Upsilon closely resembles an Italic v, while Omega is not greatly different from w, and these characters themselves are entirely different from those of the same name in the uncial alphabet. The letters Beta, Delta, Zeta, Theta, Lambda, Phi, and Psi extend their lines about one-half their height above the line. The letters Beta and Chi extend  $\frac{1}{2}$  stroke below the line, while Gamma, Mu, Phi, and Psi extend one-half their height below the line.

**147.** It is not necessary to remember the details of the shape of each of these letters, but you should be able to proportion them, when called on, according to the rules laid down, and should also know when and where to apply the uncial letter or the minuscule.

The upper and lower lines confining the letters should be drawn first, the letter A located in its proper place and drawn in ink, and then, after approximately spacing the distances, the vertical lines of the letters B, G, D, E, etc. should be drawn in ink, without further instructions. After this plate

is finished, make a careful comparison of each letter of your plate with that of the copy, and endeavor to criticize and detect for yourself any irregularity or error that may exist. If this error is in proportioning of the letter, correct it before your plate is sent in to the Schools for correction; if it is merely an error of location or spacing, let it stand, unless very serious, and it will not be counted. When satisfied that every detail is up to the standard, insert the date in the lower left-hand corner and the name and class letters and number in the lower right-hand corner.

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**PLATE, TITLE: HENRY VII**

**148.** The **Henry VII** letter dates back to the beginning of the 16th century, and takes its name from the Chapel in Westminster Abbey, London, which was built for King Henry VII, and in which his dust now lies. The letter was designed to conform to the style of architecture prevailing at that time, and was used for carvings and inscriptions throughout the Chapel. Its modern use is associated more with engrossing and ecclesiastical work; it is never used for carving in stone, though it is especially applicable for designs in pyrography, or etching on cork, leather, bone, and ivory.

**149.** The letters of this plate are divided into four lines, each  $1\frac{1}{8}$  inches high and spaced  $\frac{1}{4}$  inch apart, and the lower line but  $\frac{1}{8}$  inch above the lower border. The title is  $\frac{7}{8}$  inch high and  $\frac{1}{8}$  inch above the top line of letters. The average width of these letters is  $1\frac{1}{2}$  inches, a characteristic that did not exist in the original designs in Westminster Abbey. A peculiarity of Gothic art and architecture was that not the slightest attention was ever given to symmetry or uniformity in detail, and consequently the lettering at the close of this period is singularly marked with irregular eccentricities. Modern taste, however, demands a certain amount of decorative uniformity, and these letters have been modernized to that extent, in order to make a serviceable alphabet.

HENRY VII  
(WESTMINSTER ABBEY)

A B C D E F G H  
I J K L M  
N O P Q R S T U  
V W X Y Z

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**150.** The letters M and W are  $1\frac{7}{8}$  inches and 2 inches wide, respectively, B, C, E, and F are  $1\frac{1}{4}$  inches wide, and the letter L is  $1\frac{1}{2}$  inches wide over all. The round strokes at their maximum thickness are  $\frac{3}{8}$  inch, and the fine line is  $\frac{1}{16}$  inch. The dots at the ends of the stroke are  $\frac{1}{8}$  inch in diameter, as are also the circular white openings at the point where the stroke reaches its maximum width. The balls used in the center of the concave strokes are  $\frac{1}{4}$  inch in diameter; the only case where one of these ball forms is used at the end of a stroke is in the letter U, this detail being there but  $\frac{3}{16}$  inch in diameter. In the middle of the letters A, B, and M, a floral device is used, varying somewhat in the different letters, but all based on the trefoil, or fleur-de-lis, ornament characteristic of the period. It will be observed that a short flat spur projects each side of the white disks or balls entering into the broadest parts of the strokes. The straight lines, or beveled ends, of these spurs are drawn from a point in the center of the white disk.

**151.** This alphabet naturally has wide exceptions from the general rules laid down for the conventional alphabets heretofore described. These eccentricities are permitted simply because the letter had its origin in a class of work where the information conveyed to the reader was secondary to the ornament of the letter itself. For instance, the title Henry VII carved elaborately on a tablet, was put there to ornament that tablet, and the information that it is the name of the dead king is secondary, because the observer has time to decipher its meaning from the beauty of the detail. The letters D, O, and Q are precisely alike in this alphabet, with the exceptions of the tail added to the bottom of the Q and the ball at the top of its fine line, and the tail added to the top of the D. The vertical strokes of all letters that possess such are identical, and the middle strokes of the letters F and H are made thicker than the fine lines.

**152.** In drawing this plate, first outline the letters in pencil, omitting all attempts at ornamentation, and rounding the curves as evenly as possible to their joints with the stroke

and fine line, in the same manner as if he were laying out a Medieval alphabet. The balls, hollows, foliated work, and other ornamentation can then be added, and when all is in place the plate may be inked. In inking the plate, it is advisable to ink in all the balls and ornamental work first, and draw the plain and simpler parts of the letters afterwards, as it is much easier to connect straight or evenly curved lines to a detail than it is to plant this detail on the lines in question. After the plate is complete and blacked in, insert the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner.

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#### PLATE, TITLE: MONOGRAMS

**153.** The origin and date of letters woven together in the form of a monogram cannot be exactly located. It is of most ancient origin, however, the earliest record on which we can place any reliability being about the 3d or 4th century. As far back as the time of Constantine, the monogram of the two Greek letters, shown in No. 2 of this plate, were carried on the banners in warfare. This device, taken from the *labarum*, may be classified as an ideogram as well as a monogram. The two Greek letters Chi and Rho stand for Christ, being the first two letters of the name. It was usually employed in connection with other designs.

**154.** The monogram shown in No. 1 is a text-hand letter, interwoven in a somewhat florid style, so as to be suitable for embroidery. The form observed at No. 3 is a backhand script used largely by engravers and coach painters. No. 4 is a straight-line design, more especially adaptable for work in gold, as gold lines appear so much heavier to the eye than any color, and the lines of this alone are particularly fine. In No. 5 is shown a monogram laid in Old English letters, used to illustrate the fact that, complicated as these letters are in themselves, they are, nevertheless, susceptible of being interwoven into a monogram. In No. 6 is shown the opposite of No. 4, an interlacing of heavy letters, and is usually applied to such form of monogram as will

**158.** In proportioning the indexes, make the distance from the end of the first finger to the top and center of the knuckle of the second finger the same as from the latter point to the edge of the cuff, or, in other words, make  $ab$ , Fig. 15, equal to  $bc$ ; make the distance from  $a$ , the end of the finger nail, to  $g$ , the end of the thumb nail, equal to  $ab$ . This distance should be  $3\frac{1}{2}$  inches on your drawing, which is also the distance from the top of the cuff to the coat sleeve, or from  $c$  to  $i$ . The distance from  $d$  to  $e$ ;  $g$  to  $f$ ,  $c$  to  $h$ , and  $h$  to  $i$  is  $1\frac{1}{2}$  inches, as is also the distance from  $j$  to  $k$ . With these measurements fixed in mind, it will always be a simple matter to lay out a well-proportioned index hand.

**159.** It is not always necessary that the index should be shaded, but where such is imperative, full strength should be given, where necessary, in order to bring out the drawing in relief. The lower side should always be shaded much stronger than the top, and the shade of the coat sleeve should fade out softly toward the edges, where it disappears into the white of the paper. Be careful not to show the joints of the finger and thumb too prominently, as they only require the mere suggestion. The right index is approximately the same as the left in every respect, but both should be practiced with equal attention, as it frequently happens that a designer is capable of drawing a right-hand index extremely well, and is utterly unable to execute the same figure in the opposite direction.

**160.** The bands on this plate are extremely simple and require very little explanation. They may be used as borders to tablets or signs, or, in some cases, may be stenciled and afterwards filled in, or, with slight variation, may be used as dividing parts in an inscription, provided suitable foliated or geometrical ends form their terminals. In laying them out, the top line of No. 1 is but  $\frac{1}{8}$  inch below the upper border line, and the bottom line of No. 8 is  $\frac{1}{4}$  inch above the lower border line. Nos. 3, 4, and 5 are each  $\frac{7}{8}$  inch high, while Nos. 2, 6, and 7 are only  $\frac{3}{4}$  inch high. No. 8 is but  $\frac{5}{8}$  inch high. They should be drawn to reach to

within  $\frac{1}{4}$  inch of the right-hand border, and may be finished in an irregular manner when the motive is shown. The length of these bands is  $4\frac{3}{8}$  inches.

In drawing these, the T square and triangle may be used to execute the straight lines, as well as the compasses for carrying out the curves, with the exception of Nos. 3, 5, and 6, which must be executed entirely freehand. Proportion each part carefully; no matter how simple, do not hurry the work, and, when complete, shade the indexes and black in the borders like the original plate, insert the date in the lower left-hand corner, and the name and class letters and number in the lower right-hand corner of the plate.

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#### PLATE, TITLE: INSCRIPTION DESIGN

**161.** In the example of **Inscription Design** chosen, a variety of treatment has been introduced to exemplify a harmony in the coloring of the design, and to illustrate the several methods used to embellish various parts that will add strength and legibility to the whole. It should not be understood that colored designs require extensive treatment in all cases, as broad washes and few colors make a design that is often preferable to one that is overloaded with carefully studied coloring and an abundance of detail in its composition.

**162.** To draw the plate, use only T. S. Co.'s cold-pressed drawing paper 15 inches by 20 inches, and a 4H lead pencil. Make as few pencil marks as possible, as these must be lightly erased before the water color is applied. Beginning at the top edge of drawing paper, locate the palette, which is 1 inch from top edge and  $\frac{1}{8}$  inch from side. The extreme width of the top of palette, measuring from the left edge of paper, is  $5\frac{7}{8}$  inches, the lower portion is  $5\frac{5}{8}$  inches. The title is 1 inch from top edge and  $\frac{1}{8}$  inch high. The top edge of panel is  $2\frac{3}{8}$  inches from top edge of paper, the bottom of panel is 6 inches. The band at top and bottom of panel is  $\frac{1}{2}$  inch wide. The letters of the panel are  $1\frac{3}{8}$  inches. The end of panel is  $1\frac{1}{2}$  inches from right edge of paper. The yellow panel is  $\frac{1}{8}$  inch from right edge,  $10\frac{5}{8}$  inches long, and 4 inches wide

in center. The word Composition is  $3\frac{3}{8}$  inches from bottom edge of paper. The letters are  $1\frac{1}{8}$  inches high. The word Utility is  $5\frac{9}{16}$  inches from bottom edge, and  $\frac{7}{8}$  inch high. The green panel is  $2\frac{1}{4}$  inches from bottom edge and  $3\frac{1}{8}$  inches high,  $6\frac{1}{2}$  inches from left edge and  $10\frac{1}{8}$  inches from right edge to short vertical line. With these measurements, the general arrangement of the design may be accurately followed. To space the letters and follow their formation as shown in the copy should not require instruction on this final plate.

**163.** Colors should not be applied until the black lines are drawn and lettering is done as far as possible. First, cut in the letters on the palette, and outline the long panel; then letter the words The Utility in the Composition. Now begin on the color work by blending the long panel, beginning with the mauve purple. The pink should be an opaque color, made so by the addition of white. The colors of the band of the panel are orange chrome, burnt sienna, and black blending into Prussian blue. The shade of the letters on this panel blend from pure mauve purple to Indian red, then to orange vermillion. The space between the shade and the letter is filled in with gold color and burnt sienna, ending with clear white. The rococo panel should be blended before the ornamental edge or the lettering is done. Orange chrome in white should be used for the light, and burnt sienna for the dark portion of the panel. For the darkest shades of the ornamental edge add black to burnt sienna. For the darkest shade on the word Design use crimson lake. The ornamental border of panel should now be executed and the lettering of the design completed. The green panel should be first laid in with a medium shade of green, the lightest shade should then be applied, using a little white in combination with the green. The darkest shade is changed from a green shade to a reddish tone by the addition of burnt sienna. The shading of the letters and panels should now be done, using a natural shade made of charcoal gray and a slight amount of orange chrome.

The second shade is produced with the addition of charcoal gray only. The second shade in the word composition is made by adding Indian red to the natural shade, strengthening this with crimson lake on the first two letters of the word. White is then run in between the shade and the letter on the green panel, as well as between the shade and the letters of the two large panels. In extending the ornament from the green panel, care should be exercised to make the curves of the ornament symmetrical, and to keep the shade of the green light rather than dark, as in the latter case it will tend to confuse the ornament with the lettering.

On the completion of the design, sign your name in small neat letters either printed or written. Also attach your class letters and number as usual in the right corner, and the date of the completion of the work in the left.

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